NOVEMBER 2, 1959

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

Chemicals Contour Honeycombs

Production men are taking a close look at the chemical contouring method for honeycombs being used at Northrup Corp.'s Norair Div., Hawthorne, Calif. The process, invented by Norair's Eldon Bowman (above), may make sculptured honeycombs practical for nonaircraft products. Using a chemical etchant makes it possible to bypass the costly, tedious job of machining the delicate core walls. Cost studies on lots of 5 to 50 parts show that the new method brings a competitive edge. And it doesn't produce burrs or feather edges (Page 74).

Steel Famine Closes More Plants; Mills Ready Allocation Plans

Four Ways to Save Your LIFO

Space Structures Start to Take Shape as NASA Charts Its Needs

How to Keep Good Men from Quitting

Hot Machining Gets a Trial

Explosive Welding Is on the Way

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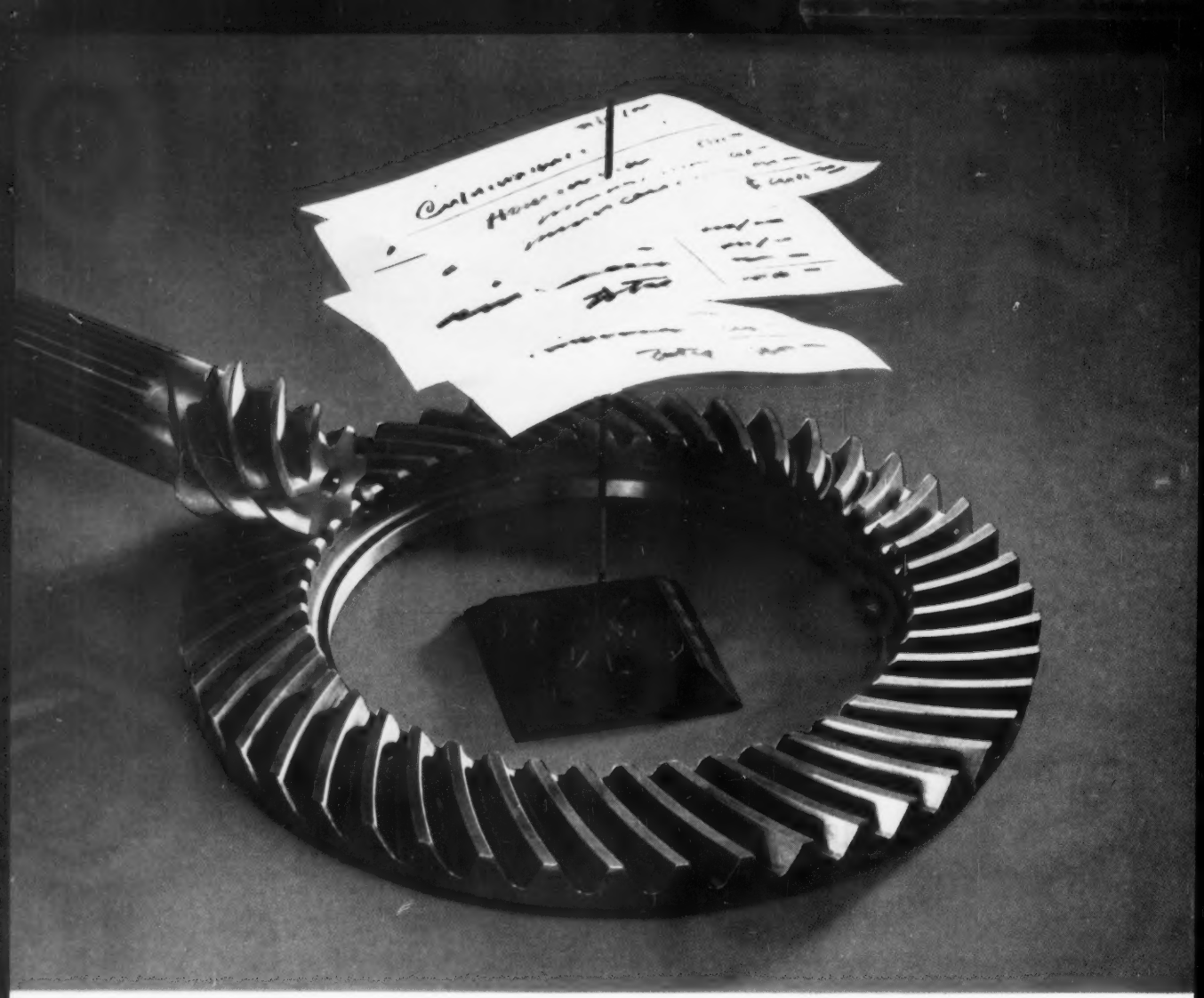
METALWORKING OUTLOOK
PAGE 29



GEAR BILLS come in "THREES"

No matter where you buy them, every gear order automatically involves three costs.

1. *The initial cost of the gears themselves*
2. *The cost of installation*
3. *The cost of service*

The second two bills—installation and service—can run much higher than the initial purchase price. That is particularly apt to be true where corners are cut to make the purchase price low.

We always strive to produce "Double Diamond" Gears at a low initial price. Even more important, they are made to standards which lower the *total* gear cost—purchase price *plus* installation *plus* service. It is *that* figure that interests us most. If it interests you, too, you may find it worth your while to consult a "Double Diamond" engineer next time you're wanting gears of the many types we make.

EATON

AUTOMOTIVE GEAR DIVISION
MANUFACTURING COMPANY
RICHMOND, INDIANA

GEARS FOR AUTOMOTIVE, FARM EQUIPMENT AND GENERAL INDUSTRIAL APPLICATIONS
GEAR-MAKERS TO LEADING MANUFACTURERS

This Week in STEEL

The Metalworking Weekly

November 2, 1959 Vol. 145—No. 18

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Metalworking Pulse ▶

TURN

Metalworking Pulse

INDUSTRIAL PRODUCTION INDEX

	WEEK ENDED OCT. 24	PREVIOUS WEEK	MONTH AGO	YEAR AGO
(1947-49=100) Based on steel output, electric power output, freight carloadings, auto assemblies	116† †Preliminary.	119	114	146

STEEL's industrial production index experienced the largest decline in the latest week since the Labor Day holiday. Delays in getting the steelworkers back into the plants precludes an early rise in the trend line.

Details on Page 59

U. S. PASSENGER CAR PRODUCTION

	WEEK ENDED OCT. 31	PREVIOUS WEEK	MONTH AGO	YEAR AGO
Number of units assembled ..... (Source: Ward's Automotive Reports.)	100,000* *Estimated.	111,120† †Preliminary.	105,720	97,804

Strike induced layoffs in the auto industry have passed the 150,000 mark and the situation will get worse before it gets better. General Motors Corp. is practically closed down. But the Little Two keep sailing along at full steam.

Details on Page 56

NATIONAL STEEL INGOT PRODUCTION

	WEEK ENDED NOV. 1	PREVIOUS WEEK	MONTH AGO	YEAR AGO
Net tons (thousands)	382*	371	362	2,024
Index (1947-49=100)	23.8*	23.1	22.5	126.0
Percentage of capacity	13.5*	13.1	12.8	75.0

*Estimated by STEEL; comparative figures reported by AISI.

Reopening of Kaiser's steelmaking facilities marks the beginning of what the metalworking industry hopes will be a steady climb to near capacity operations. About a month will be required after reopening for most mills to reach full production.

Details on Page 118

STEEL SCRAP PRICE COMPOSITE

	OCT. 28	WEEK AGO	MONTH AGO	YEAR AGO
Based on No. 1 heavy melting grade at Pittsburgh	$44.33	$44.33	$43.00	$42.00

Although STEEL's composite on No. 1 heavy melting steel scrap holds at $44.33, the market is strong. Competition for tonnages by exporters and domestic mills when they reopen may force prices higher.

Details on Page 130

FINISHED STEEL PRICE INDEX

	OCT. 27	WEEK AGO	MONTH AGO	YEAR AGO
Based on Bureau of Labor Statistics data (1947-49=100)	186.8	186.8	186.8	186.2

No revisions of price schedules on finished steel have been announced since those on galvanized products which went into effect at some mills to reflect the mid-September and mid-October advances in zinc.

Details on Page 119

How to purchase heads economically

A number of suggestions that may help you to reduce costs are contained in our new folder "Pertinent Facts on Purchasing Flanged and Dished Heads." Factors that govern the price of heads are described, and a list of the required data for orders and inquiries is included. Ordering from the stock sizes at Sparrows Point may save you time and money, and a full list is contained in the folder. A copy is yours for the asking at any Bethlehem sales office.

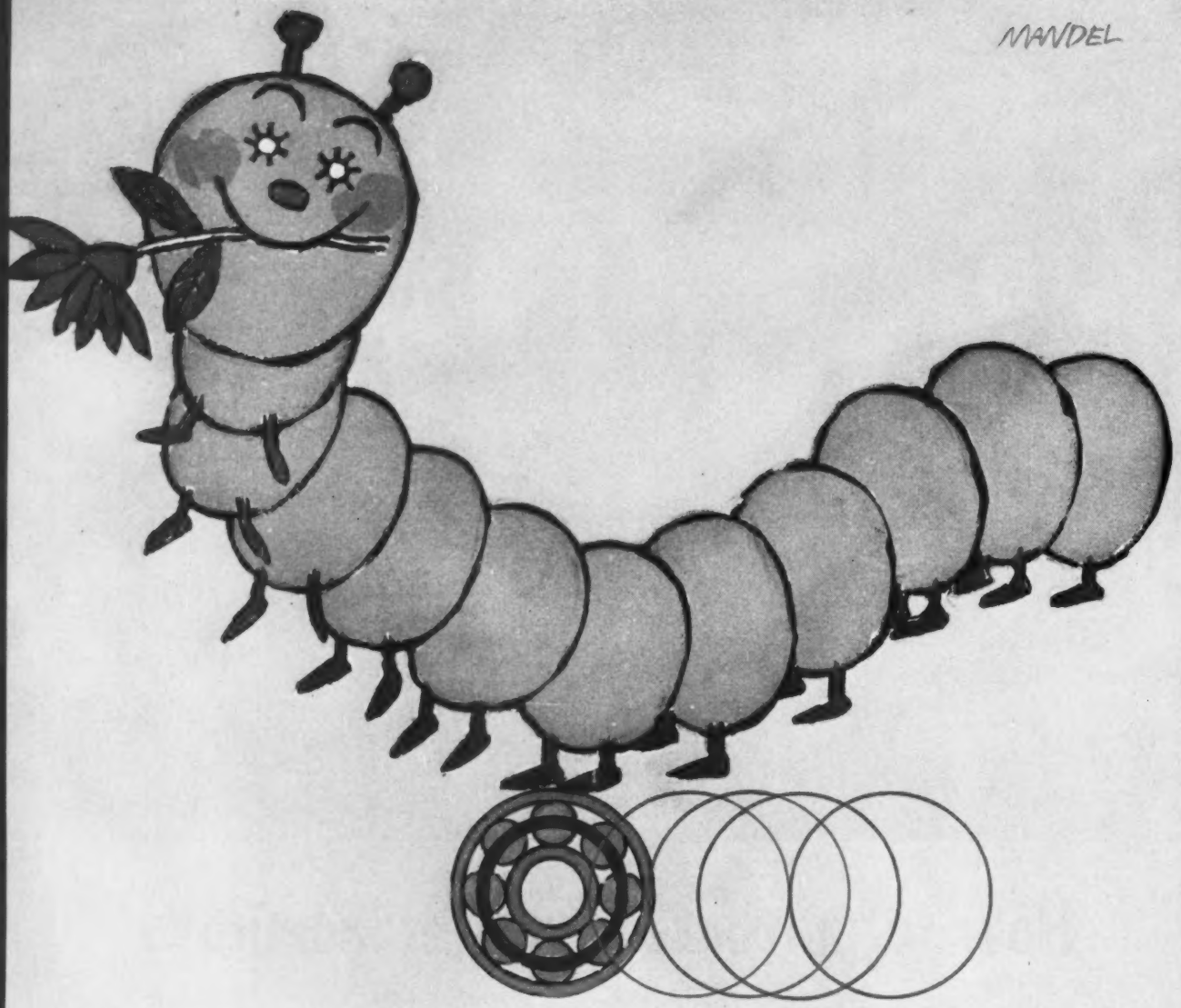
Bethlehem makes flanged-and-dished heads to meet virtually every requirement: ASME Code, elliptical and standard flanged-and-dished. Also flanged-only, dished-only, shallow-dished, double-dished, and heads for special requirements.

Bethlehem heads are available in diameters up to 144-in.—and in thicknesses from 14 gage to 2½-in. We also produce standard manhole and hand-hole saddles, covers and fittings, as well as heads with flued openings. A number of sizes of ASME Code flanged-and-dished heads are stocked for prompt delivery.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL



SMOOTH RUNNING

A bearing that turns with the greatest of ease is the bearing that's always certain to please (if you'll pardon our breaking into rhyme). And here at Federal we know that if a finished ball bearing pleases *us*, it's bound to please you. That's why Federal inspectors are such holy terrors when bearing parts reach their quality control points. And if the parts get through, the assembled product is sure to be a ball bearing that will purr sweetly—now and practically ad infinitum. So the next time you want to smooth out a rough anti-friction problem, let Federal Ball Bearings do it for you. You'll find over 12,000 ball bearing sizes and hundreds of types in our catalog. Send for it today.

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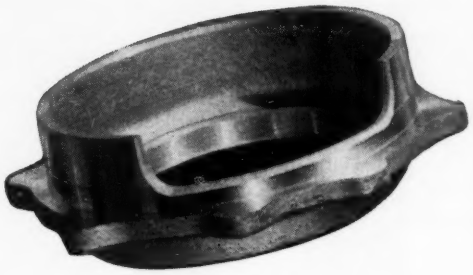
One of America's largest ball bearing manufacturers

FEDERAL ON FILM—A 16 mm. color sound film takes you through our 400,000 sq. ft. plant. Loaned free. Just ask for it.

Another cost-conscious manufacturer finds that—

When the going gets tough ...put it on a Warner & Swasey



A modern Warner & Swasey Turret Lathe's cost-cutting combination of power, rigidity and accuracy has increased production of this piece 200% for R. H. Little Co. of Canton, Ohio.

TOUGH STEEL diesel-electric locomotive parts, designed by The Timken Roller Bearing Company, are run in 500-piece lots at the rate of 12 to 15 daily on R. H. Little's new Warner & Swasey 4-A Saddle Type Turret Lathe.

In addition to heavy stock removal, severely-interrupted cuts put a terrific strain on both tooling and machine. But their Warner & Swasey's power and rigidity easily handle this job.

This same casting was previously machined at the rate of only 5 a day when run on a 20-year-old lathe. Production was held down due to the machine's lack of horsepower and rigidity. This caused excessive downtime for tool changing and required constant operator attention to maintain required accuracy.

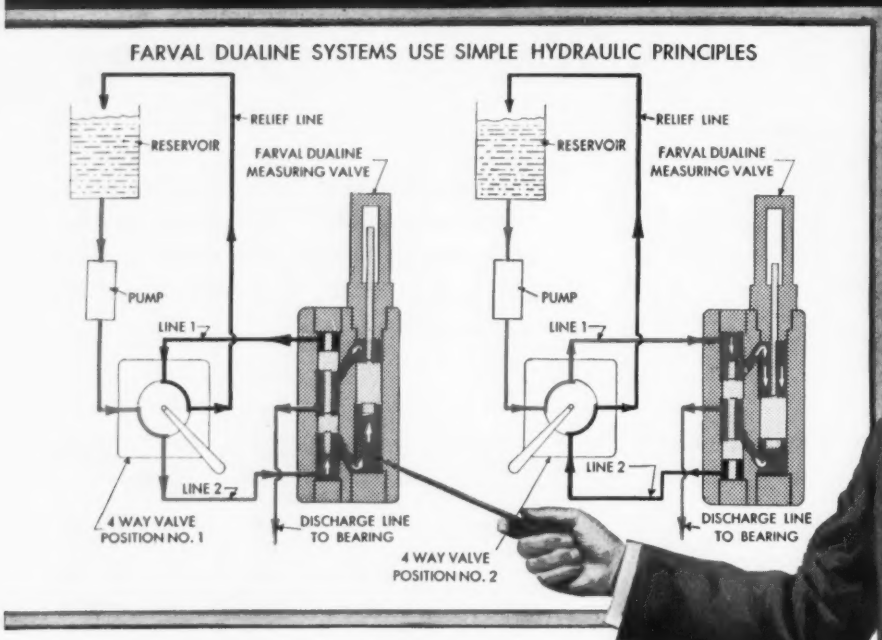
This is but another example of how today's alert metalworking management is profiting through the realization that... **When the going gets tough . . . put it on a Warner & Swasey.**

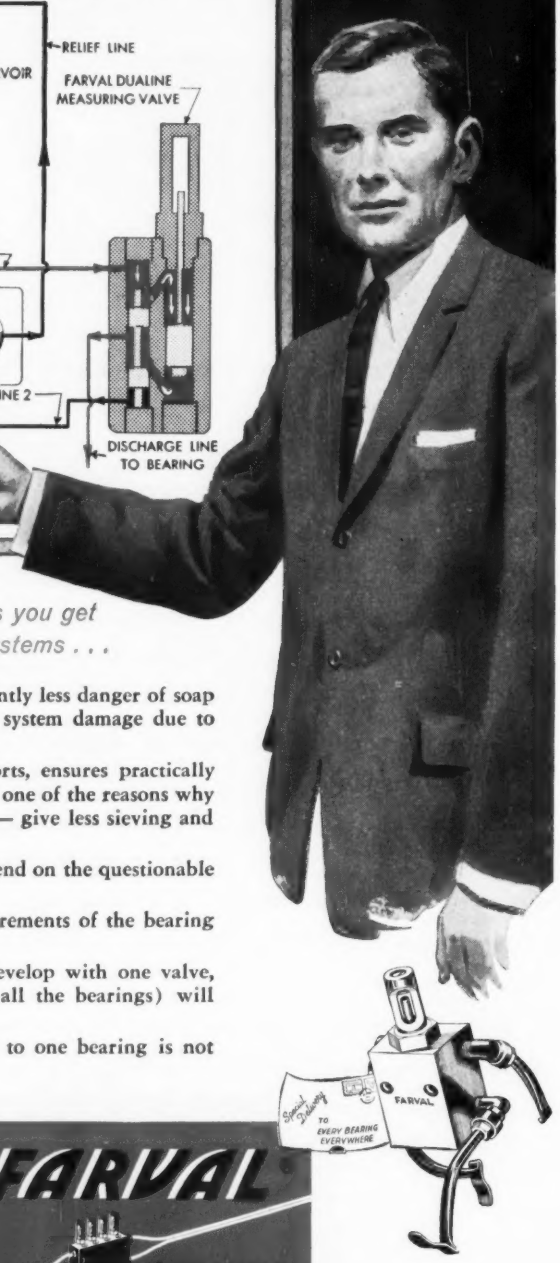
WARNER & SWASEY
Cleveland
PRECISION MACHINERY SINCE 1880

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS...WITH A WARNER & SWASEY

FARVAL
—Studies in Centralized Lubrication
No. 246

"For positive lubrication of large, medium and heavy-duty installations . . . it's a Farval Dualine System!"





With Farval Dualine centralized lubricating systems you get the following distinct advantages over other type systems . . .

(a) Much lower operating pressures with consequently less danger of soap separation on grease systems. Also, less danger of system damage due to high lubricant pressures.

(b) Large lubricant passages with no pinhole ports, ensures practically full pump pressure for every metering valve. This is one of the reasons why Farval Dualine systems operate on lower pressures — give less sieving and working of lubricants.

(c) Positive indication at each bearing — does not have to depend on the questionable action of a single indicator at the pump.

(d) Each metering valve individually adjustable for the requirements of the bearing it serves.

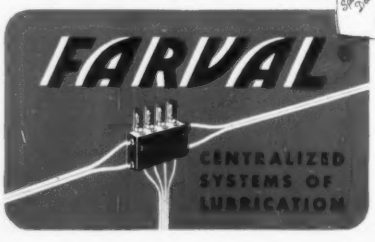
(e) Independent metering valve operation. Should trouble develop with one valve, the system will continue to operate. Only one bearing (not all the bearings) will require hand lubrication until trouble is corrected.

(f) True lubricant metering. Quantity of lubricant delivered to one bearing is not dependent on any other valve in the system.

(g) Much easier to spot and correct trouble.

Check with your Farval Representative and see how these versatile systems can improve production operations — reduce costs. Or write for free Bulletin 26-T containing complete engineering information on Farval Dualine systems. The Farval Corporation, 3270 East 80th Street, Cleveland 4, Ohio.

Affiliate of The Cleveland Worm & Gear Company
A subsidiary of Eaton Manufacturing Company



Here's Honorary Editor No. 2 . . .

. . . Larry F. Megow, general manager, Fabricated Steel Products Div., Hahn & Clay Corp., Houston. Larry wrote to us in September, asking how he could garner the title and what qualifications were necessary to meet the standards of a reader of merit. We gave him a few insights in the Sept. 14 Servicenter, and he ran with the ball from there. He scored with a five page report to the editors on how the individual on the picket line suffers during a strike. His thinking helped spark our Oct. 19 editorial, "Ask the Steelworker's Wife." While his "individual loss" theory was one of many filling the editor's mail bags, we adjudge it one of the best.

Larry's a true Space Age manager. He's president of the newly chartered Houston section of the American Rocket Society; he works on nuclear energy equipment; and he has supervised fabrication of motor cases for the Megaboom solid fuel rocket which powers sleds on the 35,000 ft supersonic test track at White Sands, N. Mex.

Larry wrote: "I'm looking forward to meeting Honorary Editor No. 1, Bob Wellman. I suppose he lives in Alaska."

Nope, Larry. Bob's in Cleveland. You still have to defer to his opinions. He holds senior rank.

It Was Our Pleasure, Sir

"Thank you for your instructive, interest-holding article ('Corporations Step Up Aid to Higher Education') in the Oct. 5 issue of STEEL," writes Frank Sparks, president, Council for Financial Aid to Education Inc., New York.

"Your generous reference to CFAE is appreciated. A major credit for the remarkable advance that has been made in corporation support of higher education during recent years is due to facile pens such as yours in the hands of hundreds of editors and writers. The facts which our shop digs up get translated into more dollars for higher education by just such co-operation as yours."

Caveat Emptor

STEEL's Quarterly Survey of Metal Buyers on Inventories and Deliveries elicited some short but eloquent replies from a purchasing agent for a stamping plant in Washington.

Under question No. 2 ("How does your inventory compare with levels of three months ago?"), he penned in "Ha, ha!" To No. 6 ("What products give you delivery trouble? Name them."), he added: "No. You name them."

Assistant Editor Derry Eynon, the guy who handled the survey, makes a comforting observation that doesn't appear in his report: Metalworking managers have a sense of humor, even when they're gulping aspirin.

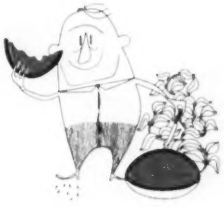
Coach or First Class?

Capital Airlines flight 325 from Philadelphia to Cleveland had an unusual passenger last week. It was carrying a color diagram and two drawings, traveling via a full passenger fare.

Ross Whitehead had obtained a story (see Page 76) on a new Du Pont degreaser that cleans, phosphatizes, and paints steel. The illustrations were prepared in Wilmington, Del., by Du Pont Engineer Jerry Hargarten, who intended to mail them to Ross.

"Too late," warned Art Editor Tom Welsh, when he heard the scheduled mailing date. "We'll never make the Nov. 2 issue." A hurried phone call to Wilmington put the artwork on the plane. It arrived at STEEL's offices 2 hours later.

Ever Cut a Hot Melon?



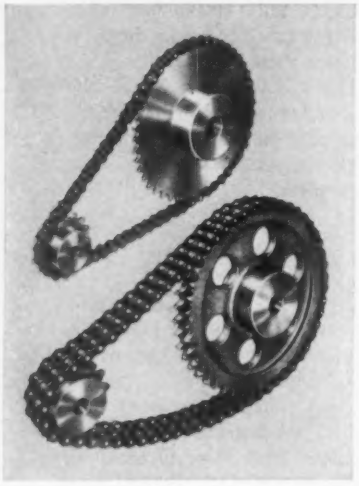
Here it is, pumpkin season, and we're talking about watermelons. At the end of this year, lots of companies will distribute millions of dollars in profit sharing, and carving up those melons promises to be a hot topic. Profit sharing has been proposed to relieve the stalemate in steel negotiations (STEEL, Aug. 17, pp. 46-47) and United Auto Worker bargainers say they will be thumping the table for a slice of it in 1961.

We've had many opinions on the topic. Here's one from the Bert Metzgers, Evanston, Ill.: "Sharing profits would identify the interests of management and labor . . . Increased benefits should go to workers only on the basis of their efforts to increase efficiency, assist technological advances, and reduce featherbedding practices . . . Offering employees a share in the profits, over

DO YOU HAVE THE PROPER

CHAIN SELECTION

FOR YOUR EQUIPMENT?



If there is a question in your mind about the correct size of chain to use for your particular installation, ACME Engineers will gladly assist you in selecting the proper chain drive. This depends on how much horsepower you want to transmit . . . the speed and size of your shaft . . . space limitations . . . hours of continuous operations, etc.

Consult your nearest ACME Distributor or write our Engineering Department for the answer to your CHAINING PROBLEMS.

Write Dept. 10-L for new 100-page illustrated technical catalog including new engineering section showing 36 methods of chain adjustments.

Acme Chain Corporation

HOLYOKE MASSACHUSETTS

and above their wages, would directly benefit workers. An effective incentive would be given the employees to reduce costs. At the same time, management would have a flexible tool for compensation, benefiting both sides in good times, not hurting management in bad times."

Pittsburgh Editor Bill Wallace has been cruising the metalworking's melon fields. He didn't find any free samples, but he did harvest quite a crop of information. He found many companies use profit sharing to motivate men and boost productivity, but plans have also withered on the vine. Check his story on profit sharing in next week's issue.

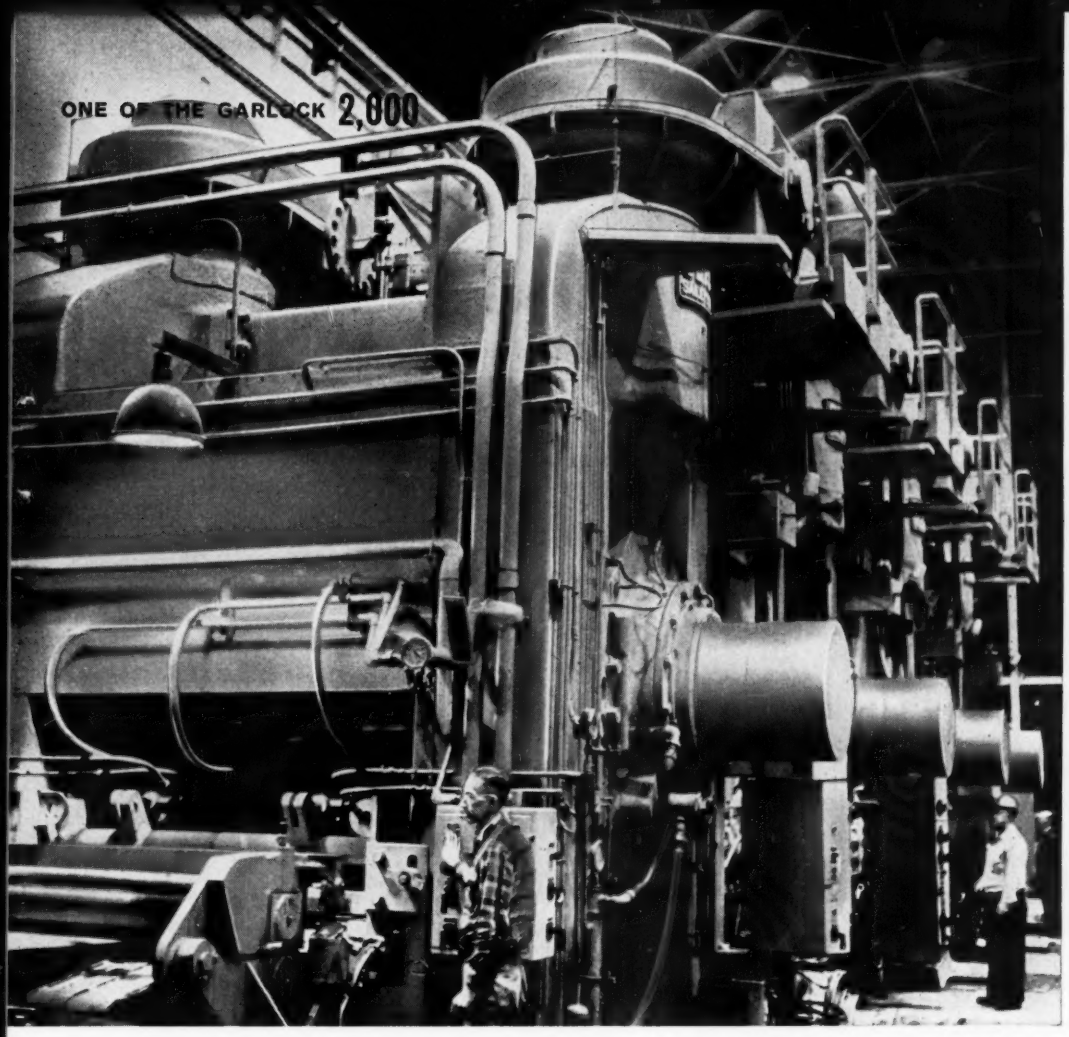
Type Casting

We present Penton Publishing's Little Theater Group. Whenever our artists need models for a story illustration, they call upon the talents of anyone in the Penton Building who willingly

fills the bill. This lens session produced a photo for the first article in STEEL's four-part series on the manpower shortage of the sixties.

In the above tintype, the bad actors, in order of appearance (l to r) Sherm Rogers, formerly of our art department, stood in as a draftsman. He's now a pork and beef raiser in Illinois. (What's that about type casting?) Bob Anderson of our sales promotion department was the sky gazing executive; the indifferent machinist with the ice tong size calipers was Tom Bryan, one of STEEL's art editors; calling for more emotion was George (Cecil B.) Farnsworth, cover artist for *Machine Design*, another Penton publication.

George was the picture taker in this instance (notice that he got himself in sharp focus). Bob Anderson appeared in many of STEEL's Marketing Workshop slides this year. Tom Bryan struck a pose earlier this year that he's still trying to live down. Seems he acted almost too perfectly in a boredom scene. From here on in he'll be "The Iceman Cometh."



Model 64 assembled KLOZURE for back-up and work rolls. Designed for large shafts, severe service.

Model 82 bonded KLOZURE for back-up and work rolls, normal to high speeds. Comes as large as 44" diameter.

Model 21 or 23 Split-KLOZURE for installation without disassembly of equipment. Medium-speed service.

Model 142 face type KLOZURE for mill rolls. Designed to seal surfaces perpendicular to shaft.

Model 53 assembled KLOZURE for table rolls, normal to high speeds. Withstands temperatures to 250° F.

On all mills—Bearings are fully protected by Garlock KLOZURE* Oil Seals

Everywhere in steel—on hot and cold strip mills, blooming and structural mills, rolling mills—Garlock KLOZURE Oil Seals prevent leakage of vital bearing lubrication. And, they further prevent damage to the bearings by sealing out dirt, spray, and other foreign matter.

Model 142, for example, keeps water splash and scale out of bearings at the shoulder of a mill roll. Models 64 and 82 are ideal for protecting bearings on back-up and work rolls; Model 53 is recommended for table rolls; and, where equipment can't be dismantled easily, Model 21 or 23 split-KLOZURES are the choice.

All KLOZURES are oil and grease resistant . . . impervious to water, mild acids, alkalies . . . non-abrasive . . . withstand temperatures from −40° F. to +250° F. For extreme conditions, Garlock furnishes sealing elements resistant to practically any fluid, and serviceable as high as +500° F.

KLOZURE Oil Seals are another part of the Garlock 2,000 . . . two thousand different styles of packings, gaskets, and seals for every need. Call your local Garlock representative, or write for Catalog 20.

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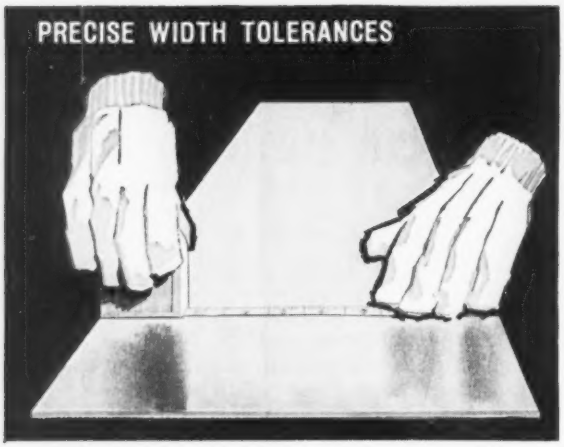
Where precision is important . . .

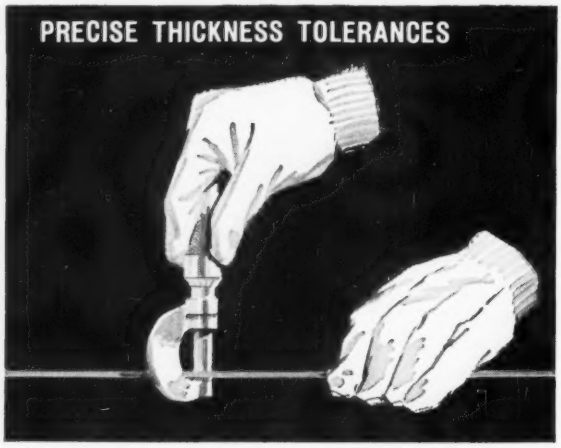
use USS Amerstrip, the "quality-

USS Amerstrip is a specialty product, rolled in quantities that permits production on precision machines, tailored to the customer's product specifications. When you use USS Amerstrip you get seven important "quality controls" not obtainable with other manufacturing methods.

The finish you get on your Amerstrip order has been specially prepared to meet *your* product's needs.



If your fabricating machines require a special width strip that's just what you'll get with Amerstrip. USS Amerstrip can be produced in any width under 24 inches . . . well within exacting tolerance limits.



USS Amerstrip can be supplied in the thickness your machines demand. USS Amerstrip is fabricated on large production runs down to thickness tolerances as close as plus or minus .0005 inches.

American Steel & Wire representatives are experts in the fabrication and application of USS Amerstrip Cold Rolled Strip. Whenever you have a need or problem involving cold roll let these experts show you how USS Amerstrip can do it better. Get in touch with our nearest representative or write to American Steel & Wire, Dept. 9353, 614 Superior Ave., N.W., Cleveland 13, Ohio.

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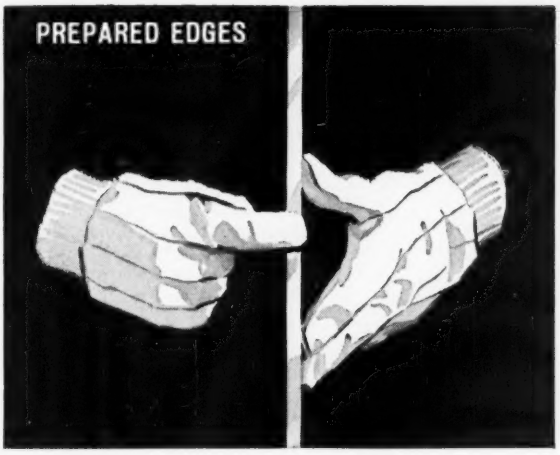
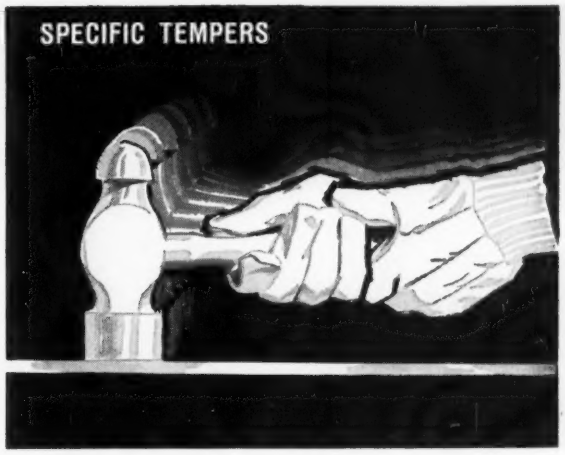
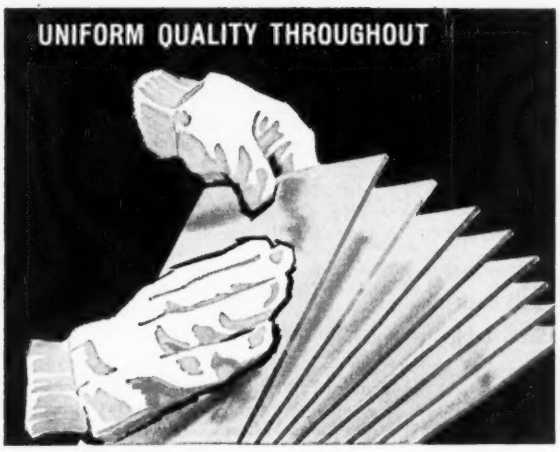
controlled" cold rolled strip steel



Because USS Amerstrip is produced in precision, order-size quantities, it can be supplied with the edge finish you need... square, standard, round, full round or bevel.



Whether your product must undergo a deep draw or other severe forming operation or require a special temper for rigidity, you'll get the exact temper you need when you order USS Amerstrip.



Whatever the size of your order . . . very large or very small, every coil of USS Amerstrip will be uniform in finish, in temper, in width and thickness. The use of USS Amerstrip will assure continuous production and high yields.

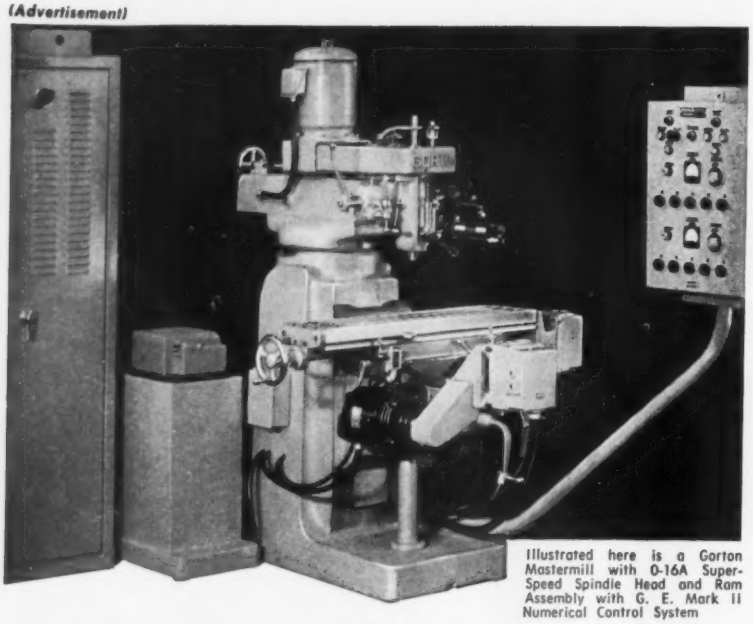
DESIGNED FOR END USE

This is really the sum total of all these other advantages. Because USS Amerstrip is "Quality-Controlled," because it is engineered to meet your needs, it assures you smoother, faster operation; a better, more salable finished product.

American Steel & Wire Division of United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
Tennessee Coal & Iron Division, Fairfield, Ala., Southern Distributors
United States Steel Export Company, New York

(Advertisement)



Illustrated here is a Gorton Mastermill with O-16A Super-Speed Spindle Head and Ram Assembly with G. E. Mark II Numerical Control System

Numerical Control Cuts Short-Run Milling Costs

Requirements of the machining problem determine the type of control

One of the truly fascinating aspects of numerical control is the way in which it changes the "impossible" into the possible . . . usually at a high profit. For instance; remarkable savings have been obtained in the production of "headache" parts, in ability to machine "out of reach" work areas, in maintenance of uniform tolerances on complicated interchangeable components, and in the elimination of waste, rejects, and high inspection costs.

Numerical control is especially suitable wherever design of parts is beyond manual control or multi-tooling capabilities, or where parts are too small to see or too large to comprehend. It is ideal when flexibility is required throughout the entire operation, or when machining requires continuous inspection.

Selecting the right control is the key to profitable operation. The control should be custom-fitted to the machine. This is particularly important in short-run applications because it is here that the greatest economies are obtainable.

The photo above illustrates a Gorton Mastermill Model 1-22 which is "custom-tailored" to numerical control for short runs . . . with built-in transverse and longitudinal table movements and vertical spindle travel. Positioning information increment can be as low as .001 with cycling up to 20 per minute. This machine, if suitable to your requirements, can bring you remarkable production economies.

Further and complete information may be obtained on letterhead request to George Gorton Machine Co., 2005 Racine St., Racine, Wis.

CALENDAR
OF MEETINGS

Nov. 2-5, Metallurgical Society of AIME: Institute of Metals Division's fall meeting, Hotel Sherman, Chicago. Institute's address: 29 W. 39th St., New York 36, N. Y. Secretary. R. W. Shearman.

Nov. 2-6, National Metal Exposition & Congress: International Amphitheatre, Chicago. Sponsor: American Society for Metals, Metals Park, Novelty, Ohio. Managing director: Allan Ray Putnam.

Nov. 2-6, Society for Nondestructive Testing: Annual meeting, Hamilton Hotel, Chicago. Society's address: 1109 Hinman Ave., Evanston, Ill. Secretary: Philip D. Johnson.

Nov. 3-4, Ultrasonic Manufacturers Association: Annual meeting, Hotel Sheraton, Chicago. Association's address: 271 North Ave., New Rochelle, N. Y. Executive secretary: C. E. Herington.

Nov. 4-6, Porcelain Enamel Institute: Shop practice forum, Ohio State University and Deshler-Hilton Hotel, Columbus, Ohio. Institute's address: 1145 19th St. N. W., Washington, D. C. Managing director: John C. Oliver.

Nov. 4-6, American Nuclear Society: Winter meeting, Sheraton Park Hotel, Washington. Society's address: 86 E. Randolph St., Chicago 1, Ill. Executive secretary: Octave J. du Temple.

Nov. 4-6, Industrial Management Society: Industrial and management clinic, Conrad Hilton Hotel, Chicago. Society's address: 330 S. Wells St., Chicago 6, Ill.

Nov. 4-8, National Tool & Die Manufacturers Association: Annual meeting, Statler-Hilton Hotel, New York. Association's address: 907 Public Square Bldg., Cleveland, Ohio. Executive vice president: George S. Eaton.

Nov. 5-6, National Foundry Association: Annual meeting, Roosevelt Hotel, New York. Association's address: 53 W. Jackson Blvd., Chicago 4, Ill. Executive secretary: C. T. Sheehan.

Nov. 5-7, Metal Treating Institute: Annual meeting, Sheraton Hotel, Chicago. Institute's address: 271 North Ave., New Rochelle, N. Y. Executive secretary: C. E. Herington.

Nov. 8-11, National Association of Aluminum Distributors: Annual meeting, El Mirador Hotel, Palm Springs, Calif. Association's address: 1900 Arch St., Philadelphia 3, Pa. Secretary: R. Bruce Wall.

Nov. 9-11, Steel Founders' Society of America: Technical and operating conference, Carter Hotel, Cleveland. Society's address: 606 Terminal Tower, Cleveland 13, Ohio. Executive vice president: F. Kermit Donaldson.

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STAINLESS STEELS

No frowns . . . just smiles when protective trim is made from high strength stainless steel. Its solid quality . . . all the way through . . . and car life beauty will gleam through years of owner pride and satisfaction. Uniloy Stainless Steel provides these qualities—plus ease of fabrication, rolled to your exact specifications.

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STEEL CORPORATION
BRIDGEVILLE, PA.

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Lubrication

NEW GREASE WITH EP PROPERTIES TAKES 700°F TEMPERATURES

In three years of field testing, a unique new grease called Thermatex EP 1 has:

—lubricated plain bearings operating at 700°F.

—regularly withstood steam pressures of 125 psi at 300-325°F for 20 hour periods.

—effectively lubricated equipment handling corrosive chemicals.

—resisted coking and solidifying in steam joints where temperatures reach 400°F.

Advantage lies in unique combination of properties

Users agree that the major benefit of Thermatex lies in its unique combination of extreme pressure properties with high heat resistance. While several greases now on the market have one property or the other, Thermatex is believed to be the first which effectively combines both.

Maintenance savings stressed

The use of Thermatex has already helped slash maintenance costs in a surprisingly wide number of applications. To indicate its potentialities —here's what happened when it was used in the steam joints of a paper drier machine: The previous grease used by a West Coast paper manufacturer would invariably solidify and coke in the last few feet of its supply line under the 400° heat. These failures occurred as often as every two weeks.

Three years ago, Texaco persuaded the manufacturer to give the experimental grease a trial. Since then, according to the user, no lubrication failures whatever have occurred, and no evidence of coking or plugging has been recorded.

Capabilities and limits

Information now available shows that Thermatex EP 1 will lubricate satisfactorily at 450-500°F when relubrication occurs every 3 or 4 days. It will provide adequate protection at 550°F with more frequent lubrication periods. Over this figure, the grease's useful lubricant life is measured in hours, but a centralized pressure system can still insure completely adequate lubrication.

For complete information and test results, check the coupon.

Oil mist lubrication gaining wide acceptance

Lubrication by means of an oil mist or fog is rapidly proving its advantages in many types of industrial machines. According to plant engineers, use of oil mist can provide a relatively inexpensive, truly centralized lubrication system.

How it works

In this type of system the oil is atomized into extremely fine particles—less than 2 microns in diameter. The resulting fog can be carried long distances through straight pipes and around bends without any appreciable condensation. The oil condenses only on fast moving parts —where it is needed. On slower moving parts reclassification fittings are used to produce either spray or droplets.

Advantages are significant

Proponents of oil mist lubrication cite a number of advantages the system has over conventional lubricating methods. They include the following:

Use of oil mist eliminates the danger of drippage which might contaminate the material being processed. Points which are hard-to-get-at or in dangerous locations can be lubricated from one convenient spot.

Positive air pressure in the system tends to check the entrance of contaminants such as water, dirt and abrasives—while the air itself provides some cooling effect.

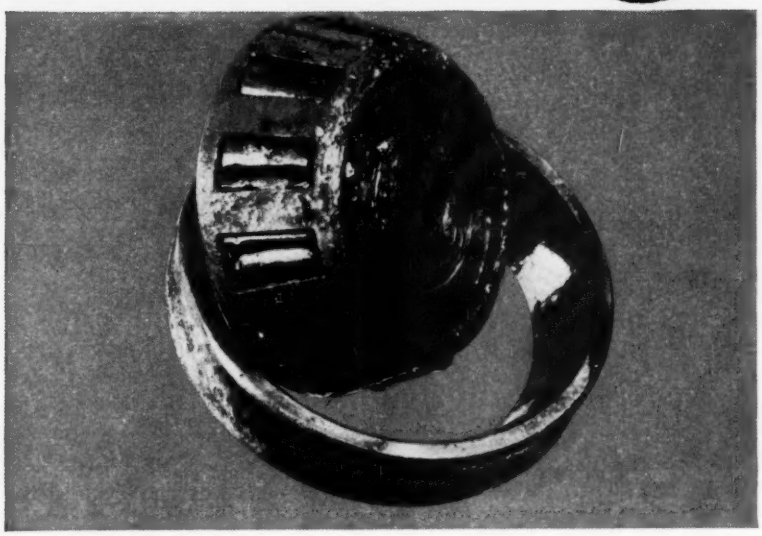
Choice of oil is important

Experts offer a word of caution when it comes to selection of the oil. To be avoided are oils containing graphite, latex, insoluble soaps, fillers or other solids. Best choice seems to be an oil with viscosity at 100°F. (SU) of not over 1,000 seconds.

Texaco products tested and recommended for oil mist applications include Regal Oil PC R&O, Regal Oil C R&O and Meropa Lubricant 1. Test results for these and other recommended Texaco oils are available. Check coupon at right.

news

TEXACO



The difference between Fe_2O_3 and $Fe_2O_3H_2O$ exonerated the lubricant in this bearing failure.

Deposit analysis can uncover surprising reasons for failure

When equipment fails, industry's natural tendency is to blame the lubricant. For this reason, samples of oils and greases—often no more than mere specks—sections of failed gears, bearings, and other ruined pieces of equipment are analyzed at the Texaco Research Center, Beacon, N. Y. Here they are subjected to a searching analysis by technical service experts using a tremendous variety of apparatus and procedures.

Lubricant is seldom guilty

Of the numerous samples submitted every year, the lubricant is guilty in less than 1% of the cases. Take a typical example:

A customer submitted the roller bearing illustrated above. The bearing and its lubricant were liberally contaminated with both red and black material. X-ray diffraction analysis disclosed that the contaminant was an alpha ferric oxide which is characteristic of fretting corrosion—usually correctable only by a design change. Had ordinary rusting occurred the contaminant would have been hydrated ferric oxide—and a finger could have been pointed at the lubricant for allowing water to come in contact with the bearing.

The March, 1958, issue of Lubrication Magazine contains a fascinating series of these "detective" stories. Write for your copy; the supply is limited.

Explains Significance of Lube Tests

The October issue of Lubrication Magazine is designed to give the lubricant user new insight into the significance of lubricant tests. The article demonstrates how the tests —which determine some lubricant properties—can help the lubrication engineer in selection of lubricants for specific equipment. Check the coupon for your free copy.

NEW PRODUCT NEWS

Chemical grinding coolant leaves no oily film—keeps machines cleaner. Helps prevent heat check, permits the use of a finer grit wheel—*Cooltex*.

Selection of cutting or grinding fluids can be critical production problem

Which is best—a straight cutting oil, a soluble oil emulsion, or a chemical coolant? Picking the right type is often a difficult problem, yet the correct choice can often yield major production savings, according to Texaco's chief Metalworking Engineer.

Multitude of factors complicate job

It is pointed out that there is no "best" type of fluid—it all depends on the type of operation. Some cutting jobs, for example, can get by with just a coolant, others—such as automatic screw machines—need a fluid that can lubricate as well as cool, because of inevitable leakage between sumps. Physical properties of the work, high heat—even hard water—can also affect the choice.

Grinding: New chemical coolant adds to choice

Chemical coolants—like Texaco's Cooltex, for example, are comparative newcomers to the grinding operation. However, many operators can point to production boosts of over 200% by using Cooltex instead of an oil. But again it all depends on the particular problems of the operation.

Expert advice can save money

Also underlined is the fact that calling in an expert to discuss cutting oil requirements can pay off for a great many manufacturers. Texaco, for example, maintains a staff of Metalworking Lubricant Engineers from coast to coast, whose prime function is consultation on cutting oil problems.

TEXACO INC., 135 East 42nd Street, New York 17, N. Y., Dept. S-LN-31

Dear Sirs:
Please send me more information on

- ☐ Thermatex
- ☐ Cooltex
- ☐ Recommendations for oil mist lubricants
- ☐ Please send the October issue of Lubrication Magazine

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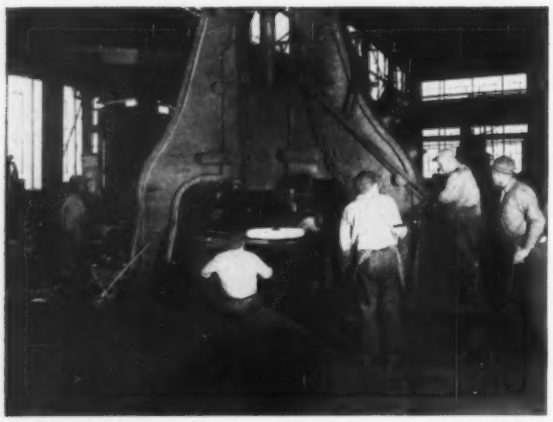
far from under the spreading chestnut–

BETTER FORGING



STAINLESS FORGING STEELS of consistently uniform quality enable the skilled hammersmiths at Charles E. Larson & Sons, Inc., Chicago, Illinois, to produce high quality flat-die forgings for a wide variety of industries. Photo shows a 6000 pound hammer punching a hole in a 600 pound stainless steel blank. This forging, used in sonar equipment, will finish as a ring 33″ outside diameter by 12″ inside diameter by 2½″ face.

Today's forging hammers wallop with tons (as much as 300). To give customers forged parts that will withstand severe torsion, tension, vibration, shock, and wear, forgers start with better forging quality steels.

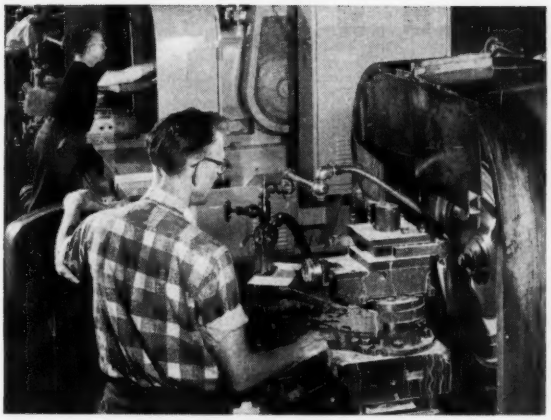
They further improve the quality by the hammer blows or high pressure of the forging process.

As the nation's largest supplier of high quality forging steels—carbon, alloy, stainless, and forging quality titanium—Republic has paced the needs of the forging industry.

Republic combines quality control at every step of production with the most advanced features of bar mill design to meet today's requirements for high

REPUBLIC

World's Widest Range of Standard Steels



FORGING QUALITY TITANIUM, TOO, is supplied by Republic. In building missiles, rockets, aircraft, and aircraft engines, titanium forgings are playing an increasingly important part because of their exceptionally high strength/weight ratios. Companies such as the TAPCO Group, Thompson Ramo Wooldridge Inc., have gained extensive experience in development of special tooling and procedures to broaden the range of forged titanium parts. Photo shows contouring face of forged titanium rotor disc with tracer-controlled T-lathe at TRW's Structures Works.

HOT ROLLED CARBON BARS in a wide variety of chemistries round out the complete Republic Steel line of forging quality bars and billets. Uniform analysis and control of physical properties from mine to your plant assure unsurpassed workability and finished quality.

QUALITY STEELS

quality forging bar products in a complete range of sizes, shapes, and materials.

Then, Republic goes a step further by providing the services of its famed 3-Dimension Metallurgical Teams —field, mill, and laboratory metallurgists. These specialists in carbon, alloy, stainless, and titanium work directly with the forger's personnel. They assist in selection, application, and processing of the right forging bar product for the job.

Write Republic Steel, Dept. ST-8394, 1441 Republic Building, Cleveland 1, Ohio, for obligation-free 3-D Metallurgical Service, and to obtain more information on Republic's better forging quality bar products.

STEEL

and Steel Products

REPUBLIC STEEL

ALLOY FORGING STEEL assures high-strength and dependability in top quality parts produced by the Palmer Tool & Forging Company, Meadville, Pennsylvania. The alloy used is Type 4140, delivered in hot rolled bars. Forgings of many intricate forms and sections are made on a job shop basis for a wide variety of end uses.

NEW WAY TO REDUCE GRINDING TIME-&-COST

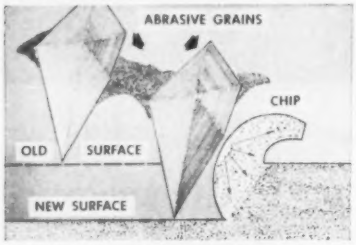
Wheel was treated by dipping into KGP's new "Dri-Kool". Cost was about a dollar—RESULTS:

1. Saved $5.40 in wheel life (wheel cost $18).

2. Got 30% more cutting action between dressings and grinding was faster.

3. TIME SAVED ON THIS JOB, NINE MAN HOURS.

SOURCE: Time-study reports of a triple-A Detroit cutting tool manufacturer, dry grinding M-3 H. S. S. with vitrified bonded wheels.



WHAT'S BEEN HAPPENING: Localized frictional heat melts the chip. Molten metal fills the pores. *The Wheel is loaded.* IN DRI-KOOL TREATED WHEELS, all pore surfaces are coated with a thermal-conductive parting medium. Heat is transferred throughout the wheel, radiating off all its surfaces.

REPORTS FROM USERS SHOW: High speed steels are now being ground *burn-free* and *burr-free* for the first time . . . Micro-finishes are improved on hard abrasive-resistance metals . . . Tool manufacturers have said, "We're now able to assure our customers longer tool life."

Impregnating with KGP's DRI-KOOL takes five minutes followed by a drying period. This one treatment lasts for the life of any vitrified bonded wheel. It won't wash out—and the dynamic balance is unaffected.

TO TEST DRI-KOOL IMMEDIATELY—order one gallon (enough for six 14-inch wheels) at KGP's introductory price of $7 (parcel post paid); or five gallons at $30 (FOB Trenton). King Graphite Products, Inc., 21946 Telegraph Road, Trenton, Mich.

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Ideal for High-Pressure "Spot-Heating" Installations!

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"Buffalo" Breezo-Fin Unit Heaters are your "best buy" for "spot-heating" applications in plants and commercial buildings. Flexible, economical and dependable, they are delivering peak performance in thousands of installations throughout the world.

Best of all, *leakage inside the unit is positively eliminated.* A one-piece, seamless copper tube extends from inlet to outlet ground joint. This provides absolutely leak-tight operation for steam pressures up to 250 pounds and 406° F. Special coils for higher pressures and temperatures can be furnished, on application, utilizing steam or hot water.

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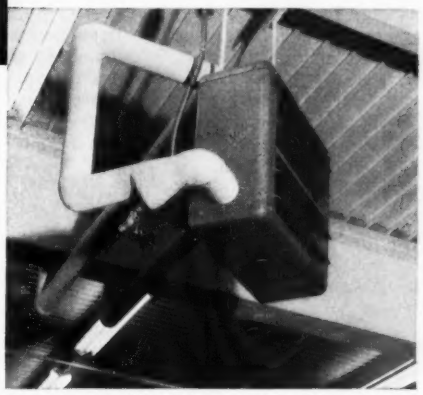
Be sure to investigate "Buffalo" Breezo-Fin Unit Heaters for *your* next "spot-heating" job. Contact your nearby "Buffalo" engineering representative, or write us direct for Bulletin 3137-E.



One of many "Buffalo" Breezo-Fin Unit Heaters installed in world's largest surgical dressings plant, equipped with special coils operating on 425° F hot water with 400 P.S.I. working pressure.

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VENTILATING • AIR CLEANING • AIR TEMPERING • INDUCED DRAFT • EXHAUSTING • FORCED DRAFT • COOLING • HEATING • PRESSURE BLOWING

What is zinc?

zinc (zink, *n.* [G. *zink*, prob. akin to *zinn* tin: cf. F. *zinc*, fr. G. Cf. TIN.] 1. *Chem.* A bluish white crystalline metallic element, brittle when cold, malleable at 120-150° C. (250-300° F.), and very brittle at 200° C. It is practically unaffected by air and moisture at ordinary temperatures. Symbol, *Zn*; at. wt., 65.37. Zinc melts at 420° C. (788° F.). At about 930° C. it boils, yielding vapors which burn in air, forming the oxide. Sp. gr. of zinc, 7-7.2. Weight of a cubic foot, 437-450 lbs.

In commerce there is a lot more to zinc than this simple definition. First, there are 6 different ASTM Specifications. Then, within various industries, there are innumerable "Custom" grades made to the consumer's *own* specifications.

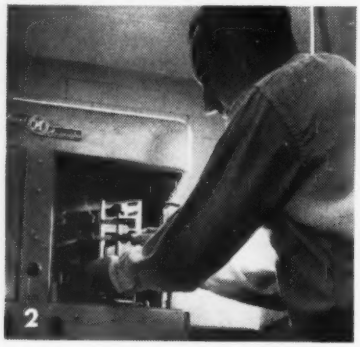
Thus, the most important factor in Zinc Production is St. Joe's metallurgical control.

HERE IS HOW IT'S DONE AT OUR JOSEPHTOWN,

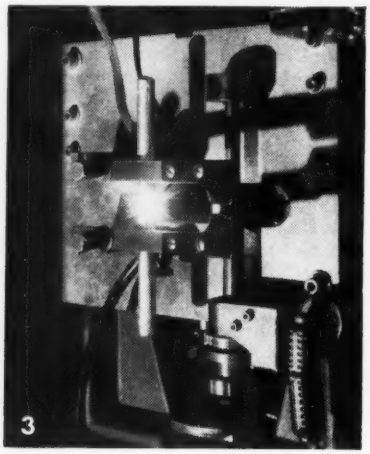
This is the final production stage of St. Joe Electrothermic zinc — a continuous vacuum-type condenser. There are eleven of them, each serving a casting bench. These furnaces are tapped every 20 minutes and from each, 1400 lbs. of zinc, perhaps part of your order, flows into the ladle. The operator using a small hand ladle casts two samples (insert shows samples approx. 1/5 actual size) and sends them via a Lamson Airtube System to . . .

. . . the Baird Direct Reading Spectrometer Lab. There the samples' sprues are removed, the ends chamferred and automatically machined to precise dimensions; they are now test electrodes 3" long that look like this:

A lab technician places the two samples in the Spectrometer's electrode holders, closes the door and merely pushes a button.



Extremely high voltage creates an arc across the electrodes. As elements are vaporized, light from the arc is broken into element lines of varying light energy. This energy, directed to photomultipliers (photo-sensitive electronic tubes), is converted to electrical energy which actuates . . .



ST. JOSEPH LEAD COMPANY

ST. JOE

250 PARK AVENUE
NEW YORK 17, N. Y.

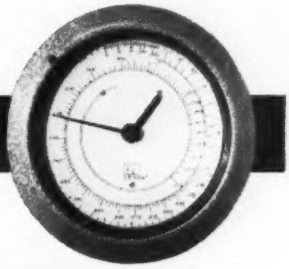
ZN-136

St. Joe can practically guarantee that once we have "tailor-made" a metal to your own specifications, we can supply you with carload after carload of zinc, unchanging in analysis. This *consistent* control of grade is one of several reasons why the records of our shipments of zinc to continuous galvanizers reads like a "Who's Who" of that industry.

When critical alloying specifications are being maintained on continuous slab casting, a sample analysis can be taken from each tap and composition confirmed *before* the zinc becomes too cold to pour.

WE ACCOMPLISH THIS BY A METHOD OF HIGH-SPEED ZINC ANALYSIS

Using a Baird-Atomic Direct Reading Spectrometer, St. Joe HAS SLASHED ANALYSIS TIME TO LESS THAN 10 MINUTES . . . *WITH A COMPLETE QUANTITATIVE REPORT ON 10 ELEMENTS!*



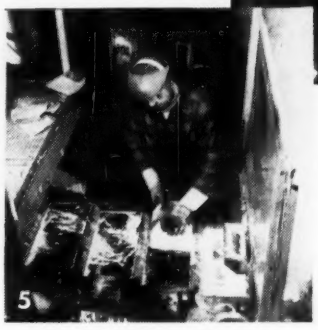
PA., ZINC SMELTER

. . . pre-calibrated dials that indicate elements **directly IN PERCENTAGES!** In five minutes the zinc sample can be completely analyzed for iron, lead, cadmium, copper, aluminum, indium, tin, antimony, silicon and magnesium. Two minutes later by return tube . . .

4

. . . casting room operators have the complete analysis. They know whether or not critical specifications are being maintained. **TOTAL ELAPSED TIME FROM COLLECTION OF SAMPLE TO COMPOSITION REPORT — LESS THAN 10 MINUTES!**

6



5

ST. JOE Electro-Thermic ZINC

HIGH GRADE **BRASS SPECIAL**

INTERMEDIATE **PRIME WESTERN**

Carl:
This sounds like what we've been looking for. Suggest you investigate
JC

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• COOPERATION IN IDEAS

Greenlee engineers work with your men at all levels of management, production, and engineering. They gather and exchange information based on broad experience. These contacts accelerate creative thinking . . . one idea stimulates another. Thus cooperative creative-engineering by Greenlee puts a profit-making investment to work in your plant.

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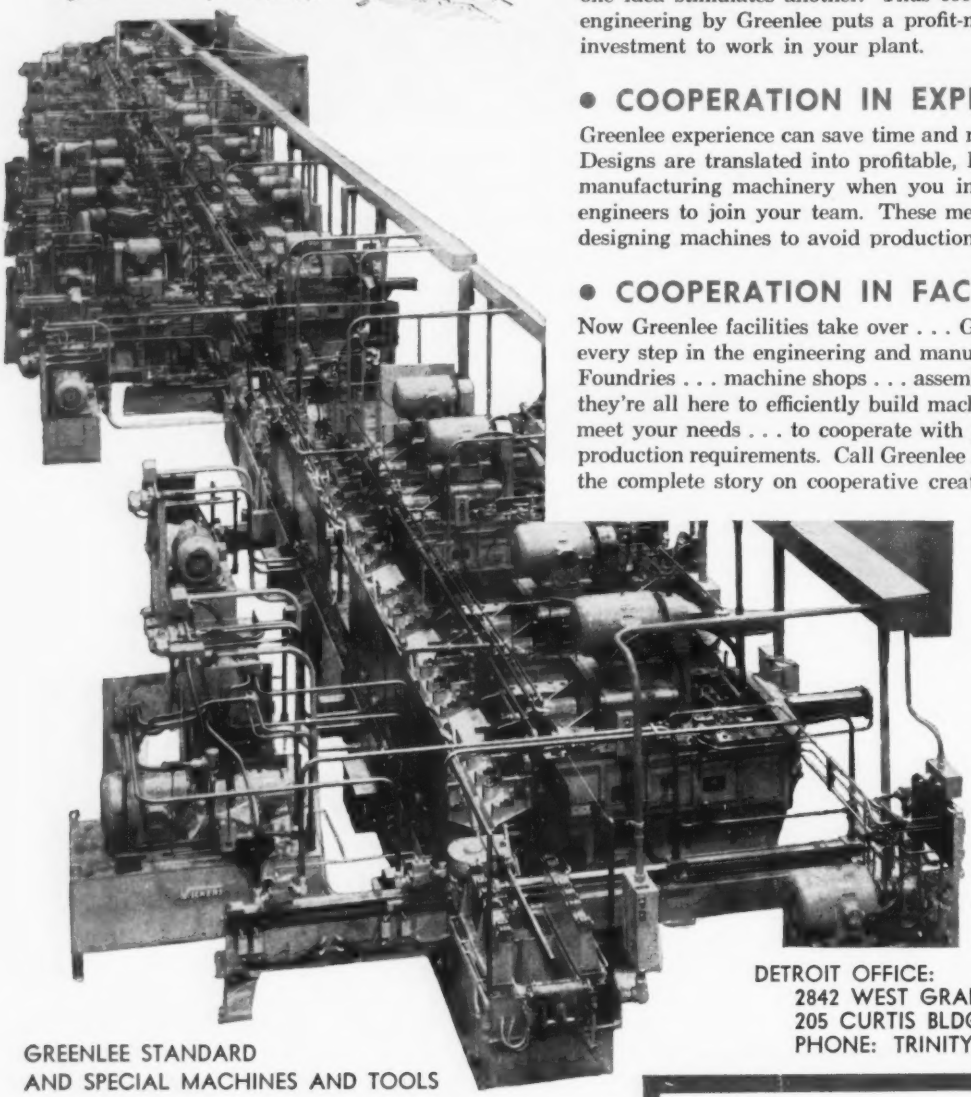
Now Greenlee facilities take over . . . Greenlee controls every step in the engineering and manufacture of machines. Foundries . . . machine shops . . . assembly floors . . . they're all here to efficiently build machines to meet your needs . . . to cooperate with you in meeting production requirements. Call Greenlee . . . let them give you the complete story on cooperative creative-engineering.



PRODUCTION MACHINERY
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Miss Jones:
write for available literature and mail this to Joe Thompson.
CF

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Machines designed with the future in mind

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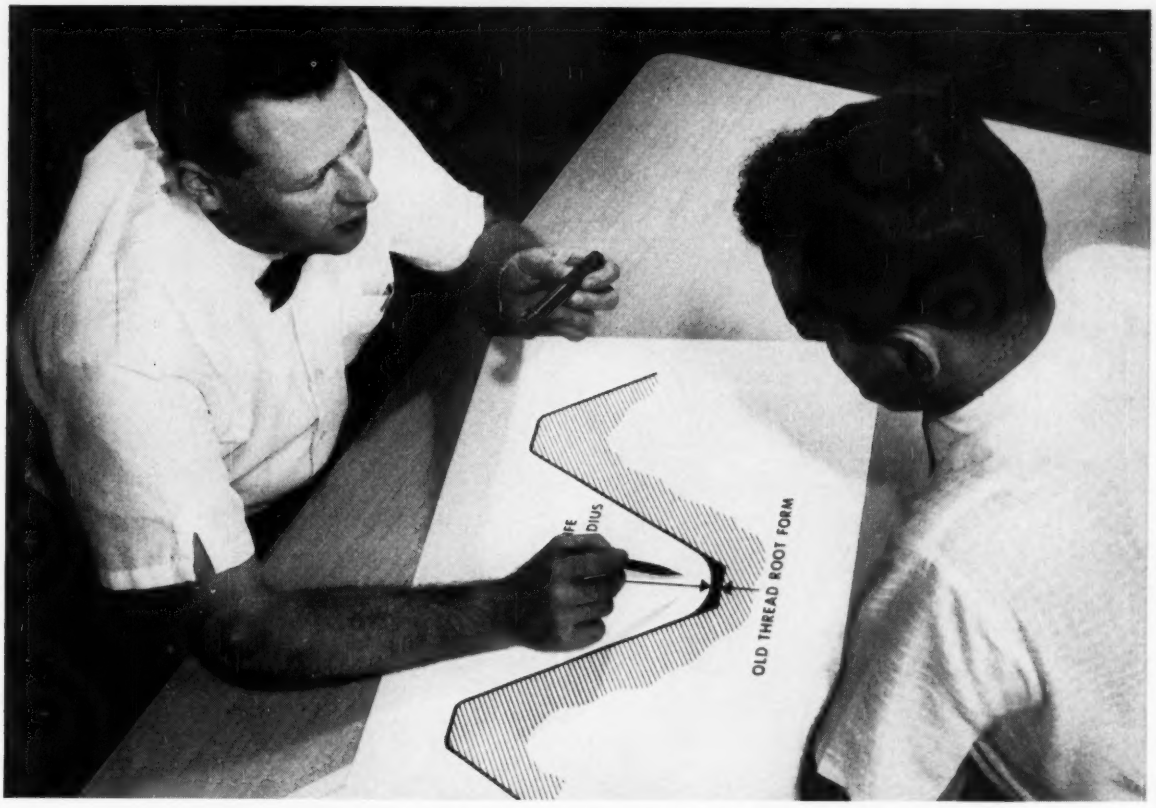
Joe: These people have a lot of machines in the Detroit area — look them over and let me know your reaction. CF

SPS RELIABILITY / *A dynamic standard of predictable performance*

The big change is in the threads



Extra strength for screw-fastened assemblies. New UNBRAKO Hi-Life thread form developed by SPS research features smoothly radiused contour, with more metal at root. New profile virtually doubles fatigue life, adds tensile strength. Hi-Life screws fit standard tapped holes, cost no more than former UNBRAKOs.

New thread form on UNBRAKO Hi-Life cap screws increases fatigue life up to 100% . . . gives your product added reliability at no extra cost.

For years the conventional thread root form for socket screws has been a truncated V with flat root. In the new UNBRAKO Hi-Life screws this is changed, the root being smoothly radiused from flank to flank. The result? A major reduction in stress concentrations at this critical point.

In terms of fastener performance, tests show the new UNBRAKO Hi-Life socket head cap screw gives you up to 100% more fatigue life than flat root screws. And you also get a bonus in tensile strength, because UNBRAKO Hi-Life has more metal at its minimum cross section. Both benefits are achieved without effect on gaging or ease of engagement.

New Hi-Life UNBRAKOs give your product added insurance against failures caused by dynamic stresses—particularly under field conditions where screws may not always be seated or tightened properly. And on the assembly line, their greater tensile strength permits higher preloading, which lengthens fastener fatigue life.

Your authorized SPS distributor has new UNBRAKO Hi-Life socket screws in stock now in sizes #4 through 1½ inch. See him for details, or write SPS—manufacturer of precision threaded industrial fasteners and allied products in many metals, including titanium. Request new Bulletin 2577.

TENSION-TENSION FATIGUE TESTS

½-20 Socket Head Cap Screws

Testing Speed: 1050 CPM	Average Fatigue Cycle Life	
Alternating Stress (psi)	Old Thread Root Form	UNBRAKO Hi-Life Thread
7,000 to 70,000	22,900	40,000
5,000 to 50,000	56,650	89,950
4,000 to 40,000	120,700	232,350
3,000 to 30,000	598,000	1,808,000
2,000 to 20,000	2,076,000	8,000,000*

*Test stopped—no failure

Tests run on ½-20 Hi-Life socket head cap screws show an increase of up to 100% in fatigue life over old-style screws with flat root. Radiused root of UNBRAKO Hi-Life thread reduces stress concentration at point where majority of fatigue breaks occur.

INDUSTRIAL FASTENER Division SPS

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of Heavy Workpieces in one set-up . . . on one machine

- Reduces machining time
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- Cuts manufacturing costs

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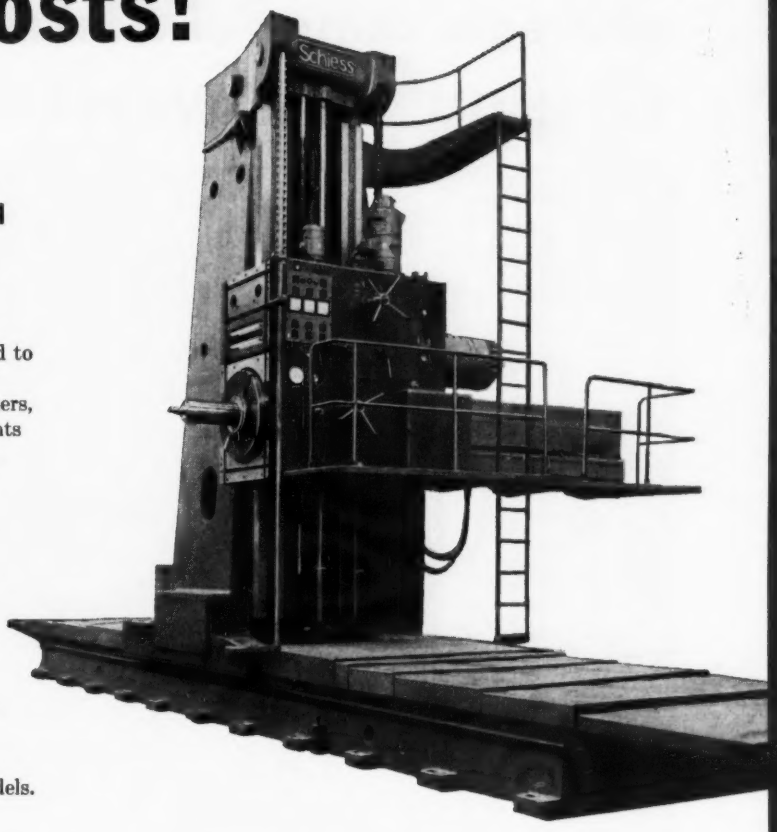
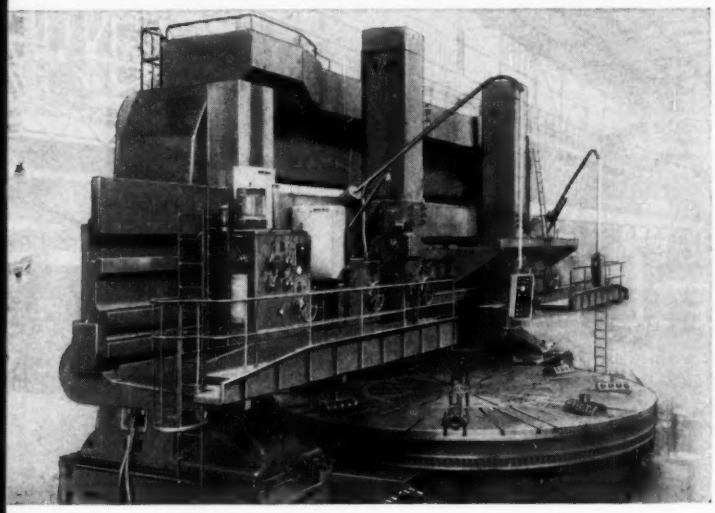


This 8⅞ in. SCHIESS model BF horizontal boring and milling machine...
now completely redesigned with many innovations. Here are a few...

Two individual drives—gear-drive for roughing, belt-drive for finishing. Belt-drive particularly suited to high-speed machining with carbide tools. New tool clamping device—does away with draw keys, hammers, drifts and binding screws. All spindle-slide movements controlled from easily accessible operating platform (or from pendant station or portable control panel, if desired). Special main-drive belt requires no readjusting. Column, spindle-slide and boring spindle may be adjusted at rapid traverse.

Spindle diameters, 6-5/16″ to 8-7/8″. Maximum diameter bored, 59″—faced, 79″.

It takes Europe's largest builder of heavy machine tools, Schiess, to turn out giants like these. Parts and service as close as Pittsburgh. And an American Schiess engineer will be happy to help you size up these heavy producers for your heavy production needs. Write for catalogs and complete specifications on all Schiess BF and K models.



This 32 ft. SCHIESS model GK vertical boring and turning mill...
Look at all these new features of the most modern vertical boring mill of its type: Two ram heads on the rail, one of which is tracer-controlled. One milling head on the rail which can be parked on the left side rail extension. Dual tables—one 15′ table on the inside, a 32′ table on the outside. Each table has independent drive, or both tables can be used together and synchronized as one. Table equipped with indexing device to be used for indexing layout work. Machine will swing a maximum diameter of 40′. Rapid traverse motions with pushbutton control of changeover from feed motion to independent power traverse. Electro-mechanical locking of cross-rail to columns. Fingertip speed control—counter-balanced cross-rail and side-head—completely enclosed swiveling octagon rams—pendant control—automatic lubrication.

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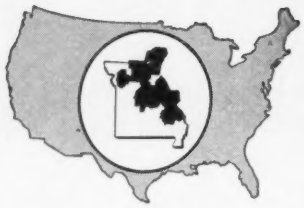
Union Electric Service Area . . . strategic center of America for INDUSTRIAL WATER



The mid-continent rivers make up the world's greatest inland waterway, connect 29 markets in 20 states.

contact: *J. E. Johanson, Manager, Industrial Development,*
UNION ELECTRIC CO., St. Louis 1, Mo.

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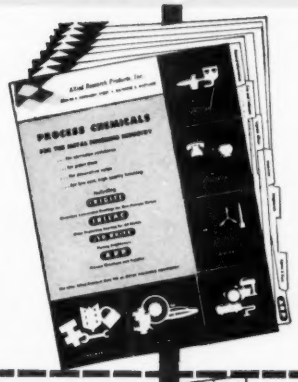

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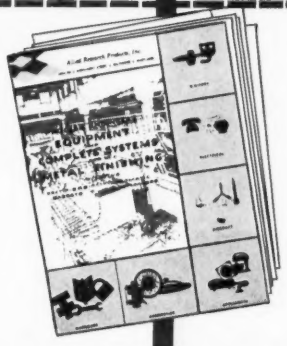
for Metal Finishing

Process Engineered—Single pieces of equipment or all equipment necessary for a finishing operation—evaluated, designed, fabricated, installed and tested to match exactly your particular process. Ask about our *Process Engineering Service.*



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for fast, economical transfer of racks and parts, conveyors to plating machines, between conveyors.

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BARRELS, TANKS and other equipment.

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Prompt service on a wide variety of daily-use necessities for the plating room, delivered from warehouse stocks strategically located in cities in metalworking areas.

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in copper and zinc.

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Whatever you need in metalworking machinery Ryerson can supply. Over 3800 types and models are available — everything from this huge bending roll to the little hand punch pictured below.

Ryerson supplies equipment produced by almost a hundred of the nation's top manufacturers—and offers you unbiased recommendations based on the experience of 117 years' service to metal fabricators. In addition, you get a double guarantee of satisfaction and greater continuing interest because of your steel and aluminum buying potential.

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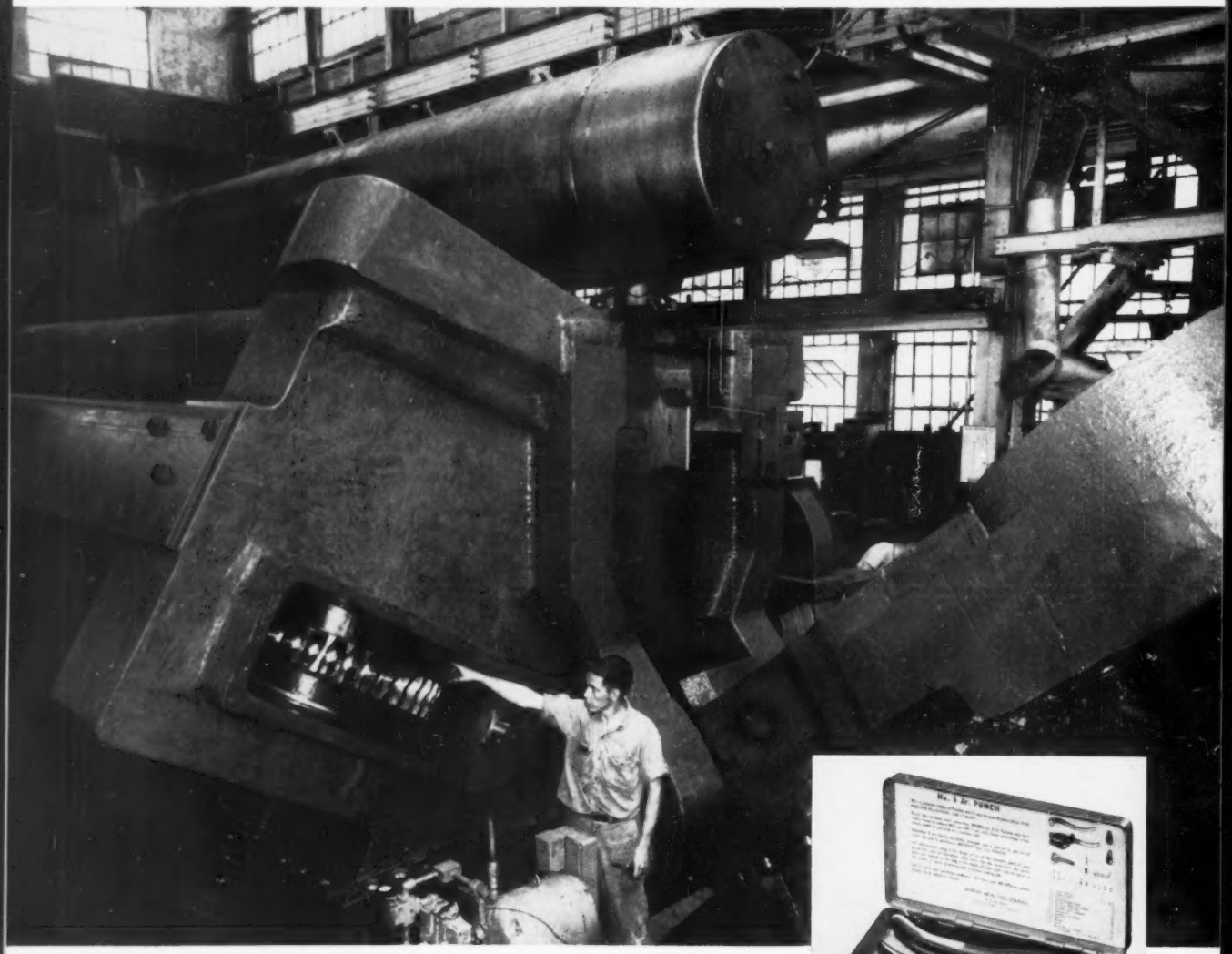
The Ryerson line includes machinery for: bending, braking, drilling, forming, hoisting, pressing, punching, rolling, sawing, shearing, threading and welding. Also a special line of material handling equipment.



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NATION'S MOST COMPLETE SERVICE CENTERS IN PRINCIPAL CITIES COAST TO COAST

Why Kaiser Signed with the USW

Edgar Kaiser, chairman, Kaiser Steel Corp., and David J. McDonald, USW chief, beam as they seal their new labor pact. Kaiser signed separately because: 1. It is not bound by many of the costly work practices that prevail in older companies. 2. It serves primarily a western market, where a little inflation is deemed normal. 3. It must deal with the USW in aluminum (Page 37).

UAW Dues Hike May Mean Trouble for You

The United Auto Workers jacked up dues from $3 a month, plus a $1 strike fund assessment, to $5 a month. The union has been operating in the red since early 1957. The extra money will be used for some purposes that directly affect metalworking: 1. To finance whitecollar organizing drives in the auto, farm equipment, and aircraft industries. 2. To push for a shorter workweek. 3. To give union officers and staff members a 3 per cent salary increase. 4. To build up strike funds.

LIFO: A Tax Dilemma for Steel Users

Steel consumers who have been using the LIFO (last-in, first-out) inventory method are in a tax dilemma. Unless they can rebuild their stocks by yearend (not likely), they'll be forced to pay substantial income taxes on "windfall profits" resulting from charging 1959 sales with low inventory costs from prior years (Page 42).

U. S. Moves into Rail Labor Talks

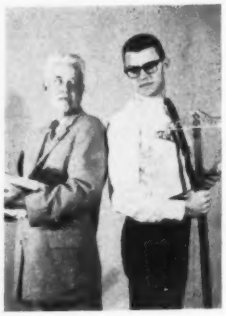
Federal mediators stepped into the railway labor dispute Oct. 26 in an effort to avert a nationwide rail walkout in early 1960. The marathon steel strike and a tougher stand by rail management are helping to create a strained atmosphere between the two sides. The three operating unions are asking for a 12 per cent wage boost; the carriers have proposed a 15 cent hourly reduction. One of the biggest issues will be featherbedding which reportedly costs the carriers $500 million a year.

Economic Barometers Still Read 'Sunny'

American Gear Manufacturers Association reports its booking index rose to 243.9 in September from 213.3 in August (1947-49 equals 100) . . . Orders

for resistance welding equipment climbed to $2.4 million in September from $2.3 million in August, reports Resistance Welder Manufacturers' Association . . . Factory sales of transistors set a record in August, reports Electronic Industries Association . . . September factory sales of home laundry appliances jumped 16 per cent above the August level, says American Home Laundry Manufacturers' Association . . . September sales of gas water heaters totaled 240,000—4.3 per cent above the level for the year-earlier month, notes Gas Appliance Manufacturers Association . . . Sales of hardware wholesalers are up 12 per cent so far this year vs. 1958, reports National Wholesale Hardware Association.

Conflict of Minds Stifles Productivity, Causes Turnover

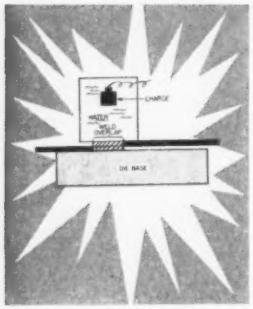


The engineer and manager in the picture portray a malady that's all too common in industry today. They can't understand each other's points of view on subjects important to company progress. Such strife causes resignations, stifles creativity, ruins efficiency, and leads to union organization of engineers. A prime reason for the tensions: Management often fails to tell the engineer the "why" behind decisions affecting him and his work. For the causes of this conflict, and for tips on how to hold onto good employees, see Page 49.

Business Failures Rise, Despite the Boom

Business failures in the U. S. last month were the largest for September in 26 years, despite a generally booming economy. Dun & Bradstreet Inc. reports 1144 businesses became casualties during the month. New business incorporations set a record for the month, climbing to 14,592.

Explosive Welding Is On the Way



Expect welding with explosives to become a commercial reality soon. That's the prediction of experts at National Northern Div., American Potash & Chemical Corp., West Hanover, Mass. The firm lists these benefits: 1. Areas impossible to reach with conventional equipment can be joined. 2. Heat-affected zones (no heat is used) are eliminated. 3. Equipment is not bulky, not expensive. Discovery of the bonding principle was accidental. Techniques resemble those of explosive forming (Page 90).

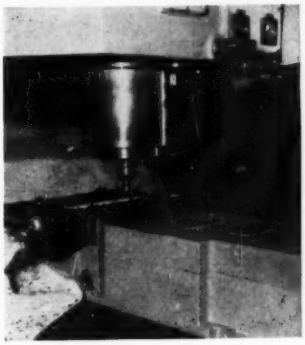
Steel Imports Bother Canada Too

"If we don't take some serious and strong steps to hold the line on costs, particularly labor costs, we are going to have a lot of idle equipment and working space in our factories," emphasizes A. L. Fairley Jr., president, Domin-

ion Steel & Coal Corp. He says average hourly employment costs in the Canadian steel industry amount to about $2.50 vs. $1.01 in West Germany, 81 cents in Italy, and 46 cents in Japan. "I don't have the answer to this one," he says. "There has been a ghastly and crippling strike in the U. S., caused by an honest effort on the part of the industry to bring some semblance of stability to labor costs."

Hot Machining Is Ready to Move Ahead

Watch for production men to give hot machining a try in an effort to whip some of their more treacherous cutting jobs. Tests with a specially rigged milling machine show that machining at elevated temperatures can boost metal removal as much as eight times the conventional rate. Two projects at North American Aviation Inc. lead to that conclusion. Good surface finishes and tolerances are achieved. Tool life is a problem NAA seems to be overcoming (Page 78).



Strike Spurs Imports of Coke Chemicals

The chemical process industries' supplies of coke chemicals were choked off by the steel strike. Unable to find sufficient naphthalene in world markets, domestic firms have turned to importing phthalic anhydride (nearly 3 million lb will be imported this year vs. only 343,000 lb last year). That's a big turnaround for the U. S., traditionally a large exporter of this chemical.

We Still Have Space Problems Galore

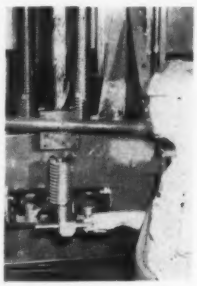
In our race with Russia, we still have to solve many structural problems in our space vehicles. We must also decide which rockets are best for launching and pick the propulsion system we want to use in outer space. No one knows how many of these problems the Russians still must solve, but most experts put them far ahead of us. The National Aeronautics & Space Administration is working on materials to withstand the outer space torture tests (Page 44).

Michiganders' Goose Is Cooked

Since Michigan's penny increase in its sales tax was declared unconstitutional, the state is near bankruptcy again. Its collections are $110 million shy of what it needs. The only moves made thus far by the state's politicians have been attempts to lay the blame for fiscal problems at one another's door. Michigan's governor, G. Mennen Williams, has presented a grab bag of tax possibilities to legislative leaders, telling them he doesn't care which ones

they pick—but pick something. Meanwhile, the state moves rapidly toward debts so large as to force it to close hospitals, colleges, and other institutions. Already, it has postponed construction projects, canceled an order for cribs for mentally retarded children, and restricted out-of-state travel by state employees.

Cutting Tools Come Out of the Doldrums



Look for 1960 sales of cutting tools to rise 7 to 12 per cent above this year's level. Manufacturers are recovering from last year's slump which saw volume sliced to half the 1957 total. The industry sees gun-drilling, trepanning, and carbide tools as the largest growth areas. Imports bring the biggest headache. They affect cutting tools three ways: 1. Imports of the tools themselves. 2. Imports of tool steel. 3. Imports of products on which cutting tools would be needed if made in the U. S. (Page 39).

Strike Forces Stoppage in Freight Carbuilding

The Pennsylvania Railroad's freight carbuilding program at Altoona, Pa., will be halted today (Nov. 2) because steel supplies are exhausted. About 3500 men will be furloughed. It'll take at least four weeks after the mills begin to operate for carbuilding operations to start again.

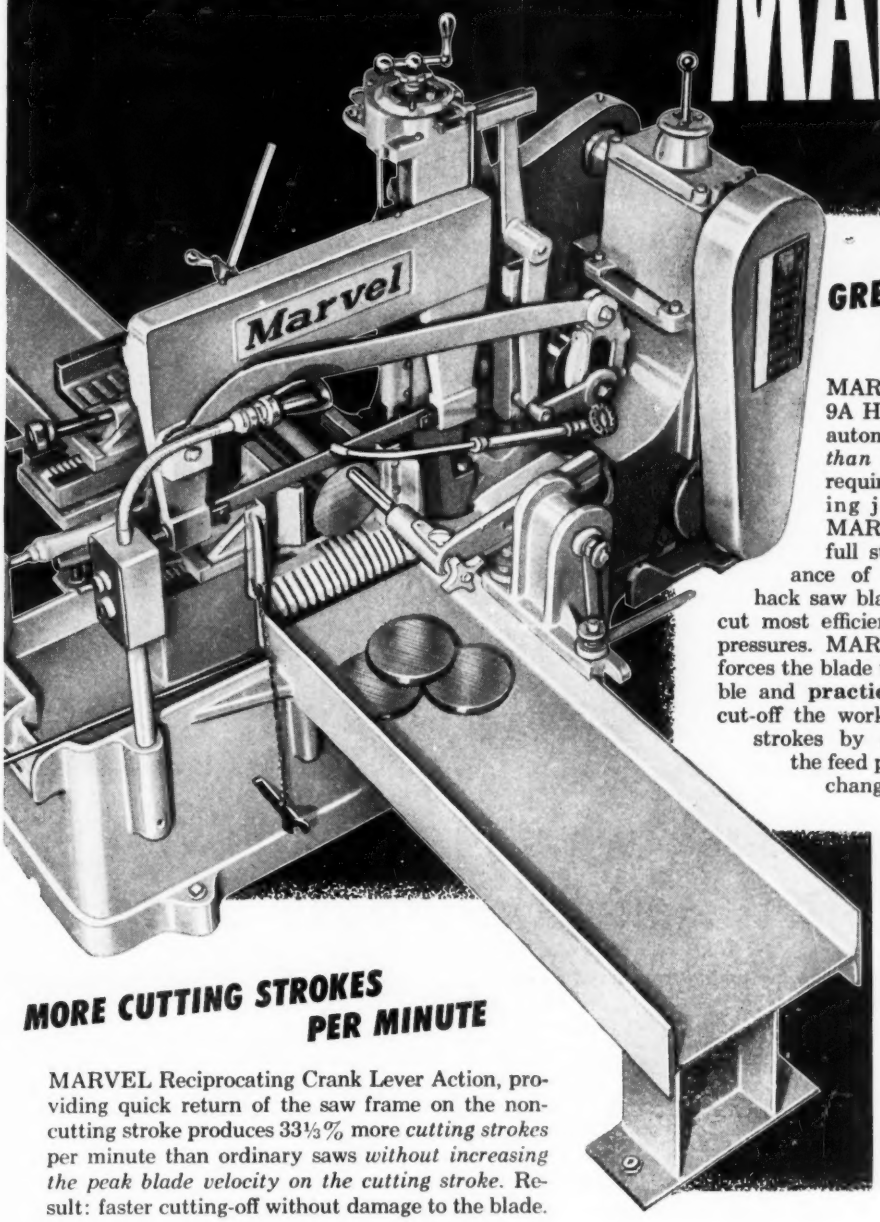
A Dual Challenge for Marketeers

Says the Chase Manhattan Bank: Metalworking companies must meet this double challenge in the coming decade: 1. Adjust production to growing and shifting demand. 2. Meet the merchandising problem presented by an increasing number of young people, the rising importance of the replacement and luxury markets, and the bewildering variety of products for sale. Chase Manhattan predicts that total consumer market (in real terms) will be 35 to 40 per cent larger in 1970 than it is today. The most rapid population growth in the next five years will be in the teen-age bracket. After 1965, the big growth will be among people in their 20s—the bracket that has the most dynamic effect on the economy.

Straws in the Wind

September orders for machine tools totaled $59.6 million—$7.4 million more than in August, reports National Machine Tool Builders' Association. It means September was the third best month in more than two years . . . September orders for industrial heating equipment totaled $5.6 million—down 43 per cent from August, says Industrial Heating Equipment Association . . . The fabricated structural steel industry booked 284,114 tons during September for the sharpest order upturn this year, reports American Institute of Steel Construction . . . Living costs climbed 0.3 per cent last month to another record . . . Private home starts this year are almost certain to exceed 1.3 million units—for a near record . . . An English car dealer, Albert Birt, paid $60 million for 40,000 cars at the London Motor Show; he plans to sell them to Americans "on snob appeal." The word "imported" means class to us, he told a London reporter . . . Calvin L. Dingler, director of the Erie, Pa., port, predicts the Great Lakes will be open to year-around traffic, but it may take 30 to 40 years . . . Martin Co. beat out Westinghouse Electric Corp. for an Atomic Energy Commission contract to develop a simplified reactor.

How Can Any Hack Saw Cut As Fast As a MARVEL?



GREATER EFFECTIVE FEED PRESSURE

MARVEL Series 6, 6A, 9 and 9A Hack Saws are capable of automatically applying *more than twice the feed pressure* required for most hack sawing jobs. This means that MARVEL Saws can utilize the full strength and heat resistance of the modern composite hack saw blade which is designed to cut most efficiently under heavier feed pressures. MARVEL Dual Power Feed forces the blade to cut as deeply as possible and **practical** on every stroke—to cut-off the work in the fewest possible strokes by automatically adjusting the feed pressure in relation to the changing work resistance.

MORE CUTTING STROKES PER MINUTE

MARVEL Reciprocating Crank Lever Action, providing quick return of the saw frame on the non-cutting stroke produces 33⅓% more *cutting strokes* per minute than ordinary saws *without increasing the peak blade velocity on the cutting stroke.* Result: faster cutting-off without damage to the blade.

With far greater feed pressures automatically available, plus more cutting strokes per minute, is it any wonder that MARVEL Series 6 and 9 Hack Saws will give you faster, accurate cutting-off every time?

Marvel Saws

Catalog C85 has complete details, facts and figures on both Marvel metal cutting Hack Saws and Band Saws. Write for it today.

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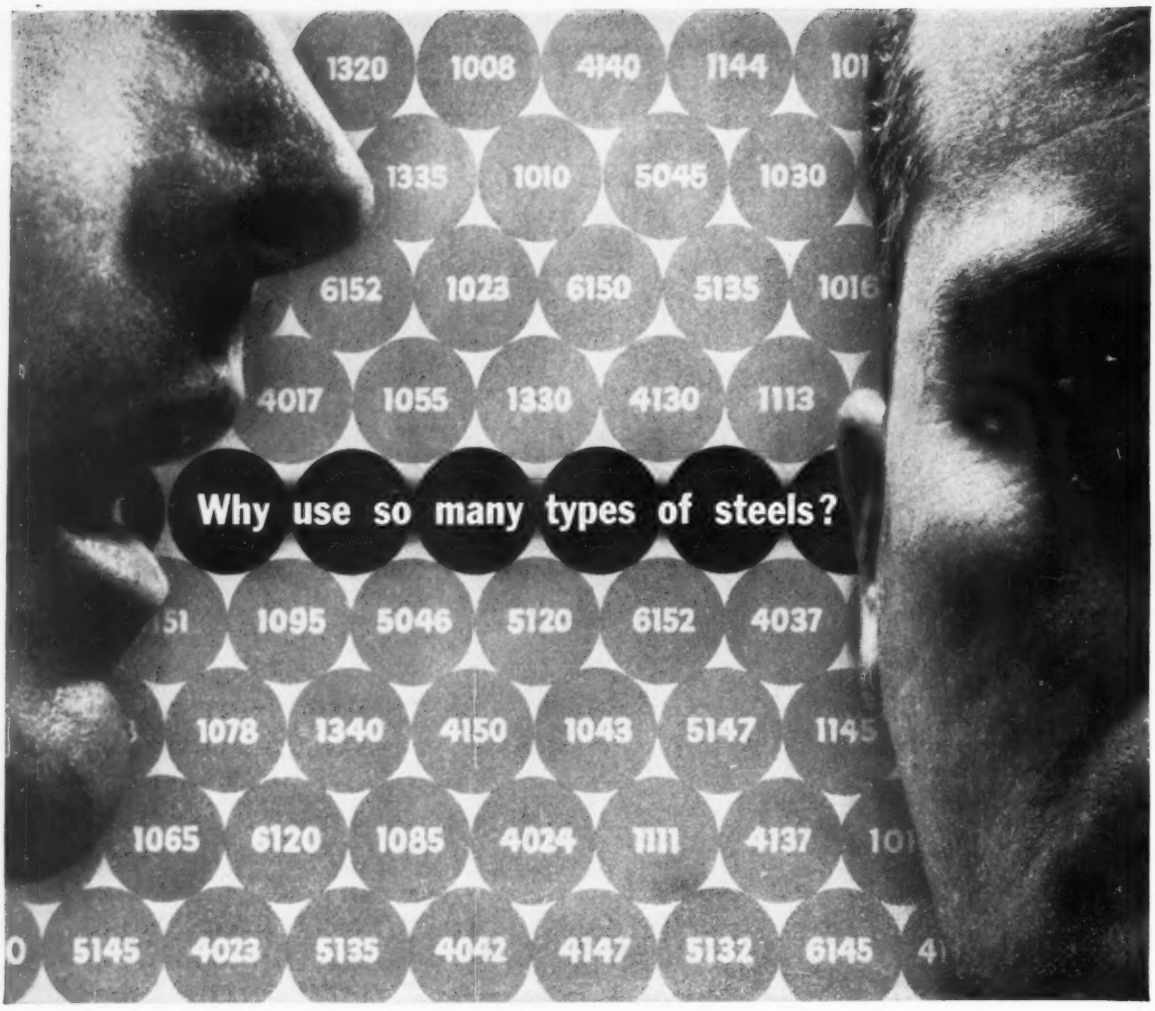
Metal Cutting MARVEL SAWS
Better Machines-Better Blades



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You make your job easier and you standardize, simplify, and save money...

These two General Purpose alloy steels can solve most of your steel selection problems. One a carburizing type . . . the other a through-hardening type – with just these two alloy steels you can satisfy practically all your engineering requirements.

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When you need through-hardening steel, simply specify 4340. It's ideal for parts of any section size. It provides exceptionally high strength and toughness. Responds reliably to heat treatment. It's weldable under proper conditions and machines at relatively high hardness.

And when you want to carburize, simply specify 4620 steel. It resists warpage and distortion in heat treatment. Responds reliably and uniformly, too. Provides a tough, strong core to support the hard wear-resistant case.

Best of all, both are carried by Steel Service Centers from coast to coast, ready for delivery right off the shelf. If you need heavier-duty or special purpose steels for very particular applications, suitable nickel alloy steels are also available from your Steel Service Center. To get a buyer's guide of centers that carry 4340, 4620, and other nickel-containing grades, simply write Inco.

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INCO TRADE MARK

Look for Boom in 1960!

The most devastating steel strike in history has cost the nation almost 31 million tons of lost steel production, about $1.6 billion in lost wages and salaries, and hundreds of millions of dollars in lost profits.

There is no doubt that the strike losses will be felt for many months.

However, the situation is not as bad as it seems.

Operations of most metalworking plants have not been disturbed by lack of steel. Some could have operated well into 1960. Consumers could draw on inventories which totaled 26 million tons at the start of the strike, production of more than 1 million tons a month from plants still operating, and imports of 400,000 tons a month.

Despite the inconveniences, there is little reason to believe that the steel strike put more than a dent in the business upswing which started in 1958.

On the contrary, the rush to replenish inventories will give business an added shot in the arm.

The steel strike will extend the life of the upswing.

As a matter of fact, the four years 1958 through 1961 are following the pattern of the preceding four years, 1954 through 1957, when we experienced an inventory buildup and expanding business followed by a necessary adjustment.

Such adjustments can be expected in the decade ahead. By 1970, gross national product is expected to reach a staggering $850 billion, metalworking sales $300 billion.

In the meantime, look for a boom in 1960!

Irwin H. Such
EDITOR-IN-CHIEF

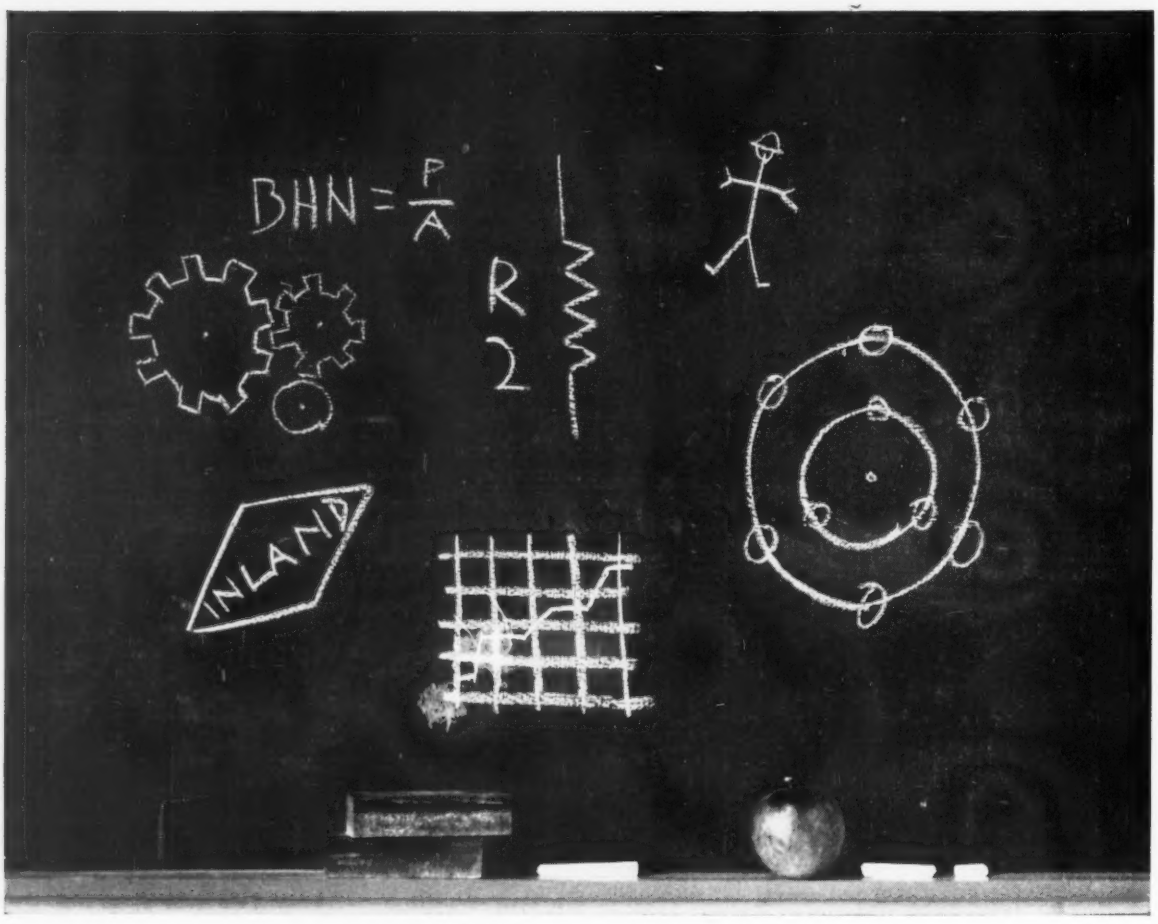
14,089 Inland employees went to school last year

Many went because they were enthusiastic about their jobs—inspired by the advancement opportunities at Inland. Others went because Inland, ever on the watch for men capable of developing their abilities, sought them out—found them—encouraged them to take the next step.

At Inland, this thoughtfully planned system of seeking for such men within the company, has now been in continuous operation for more than fifteen years. Because of it, more than 70% of Inland's supervisory staff have come up from the ranks—30% more from Inland's College Recruitment Program. Because the system encourages personal growth, the process never stops. It may begin with on-the-job training programs in which 3,842 employees participated last year. It can continue through Inland's programs in conjunction with leading educational institutions, such as Harvard, Purdue, University of Chicago and Wabash College.

With literally thousands of Inland men building their own futures, a new kind of climate is created—a climate in which men find real satisfactions in their work and the products of their labor. It results, we believe, in a growth-minded organization—a company dedicated to ever better service and products for every Inland Customer.

Building Today, with an Eye to Tomorrow



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Steel Famine Shuts More Plants

WHILE the courts fiddle in the steel case, metalworking burns.

An estimated 350,000 metalworkers have already been laid off for lack of steel. The number will increase 40,000 to 50,000 a week for the next several weeks, regardless of what happens.

• **Scarce Metal**—Four of five metalworking plants will be out of, or nearly out of, steel within 30 days, a STEEL survey shows (Page 111). When the entire steel industry goes back to work, whether by injunction or settlement, the companies will take at least four weeks to get up to 90 per cent of capacity and six weeks to reach that rate of shipments.

Forty-two per cent of the survey respondents have stocks below the ten day level. About 37 per cent are in 10 to 30 day category. Some 21 per cent have reserves exceeding 30 days.

• **The Kaiser Plan**—Even the Kaiser settlement won't help much of metalworking because that steel company accounts for only 2 per cent of national capacity. Its market is confined largely to the West. Three other steel producers that had signed as of last week (Detroit Steel Corp., Continental Steel Corp., and Wickwire Bros. Inc.) had not been struck. Detroit's economic terms are similar to Kaiser's. Several weeks ago Continental and Wickwire signed pacts tailored to their circumstances.

The economic terms of the Kaiser pact will cost the company about 10 cents per hour in fringe benefits in the first eight months, another 12.5 cents per hour in the next 12 months (including a cost of living increase that would be limited to 3 cents per hour). The basic wage agreement expires July 1, 1961. The insurance and pension benefits run out Nov. 1, 1961, but they are subject to negotiation, with the right to strike, when wages come up.

Supplemental Unemployment

Kaiser, USW Agree to Labor Studies

THE KAISER PLAN—as it is certain to become known—may chart new directions in steel labor relations. Most observers agree you must go beyond sections dealing with wages and fringe benefits to find the full meaning of the pact with the United Steelworkers.

Three management-labor committees' jurisdictions: 1. The future of the company and its employees. 2. The relation of the company and its employees to technological change. 3. Employee health benefits.

A nine man committee, with Dr. George Taylor as chairman, will be set up to recommend "a long range plan for equitable sharing . . . of the fruits of the company's progress . . . among stockholders, employees, and the public." The committee is directed to report by July 1, 1960. Criteria for the plan will include: Safeguarding employees from a rising cost of living; a reasonable sharing of the results of increased productivity; and provision for necessary expansion of the company. Recommendations of the committee may be substituted for the agreement just signed if both sides agree.

A second committee will study the problems resulting from automation and technological change. Local working conditions will be considered under this heading.

The third committee will consider the workings of the Kaiser Foundation health plan. Last week, both the union and Chairman Edgar Kaiser hastened to deny that the committee approach will lead to profit sharing.

benefits costs go to 5 cents an hour. Pension and health benefits will rise. After July 1, 1960, production and maintenance workers get 7 cents an hour if they are in job classes 1 and 2. Others receive base increases plus class increments of 0.2 cents per hour, so that the top job classification will get a boost of about 9 cents an hour.

• **Pact Costs**—While Kaiser figures the cost at 22.5 cents over the life of the contract, Detroit Steel calculates the expense at 24.5 cents. The same terms would cost the producers remaining in the steel case about 33.5 cents an hour. Variations arise from different pension and other costs.

The steel companies remaining in the wage case last week were standing on their offer, a 30 cent package, with possibly 3 cents more as a cost of living adjustment over a three year period. Work rules would be subject to arbitration.

• **Court Battle** — Negotiators were marking time last week, waiting for the Taft-Hartley injunction situation to sort itself out in the courts.

Besides Kaiser's facilities, 71 plants of 61 companies are still operating: 36 plants operate on United Steelworker extensions of one kind or another; three have settled; five have unexpired contracts; 27 do not have USW contracts.

• **Question of Prices** — The companies still out continue to fight for a noninflationary pact that will enable them to hold the price line. Kaiser's chairman, Edgar Kaiser, says his company will not increase prices now, but he left the door open (see Kaiser story on Page 37).

Steel Profits Sink In Third Quarter

THE LONGEST steel strike in the nation's history has severely cut the industry's third quarter profits. U. S. Steel Corp. recorded its first loss since the third quarter of 1938. Struck firms operated only two weeks during the quarter. Preparing for the strike lost production time.

• **Problems** — Even for the firms that operated in the third quarter, reversal of the shutdown procedure lost additional output. The unusually high steel demand in the first half left many companies with inventory and maintenance problems. As a result, profits declined from second quarter levels.

But with the problems remedied, more shipments and improved earnings are anticipated for the fourth quarter for companies not struck. "Operations scheduled for the quarter indicate it should be the best of the year," states J. A. Sisto, chairman, Phoenix Steel Corp., New York. Comments Charles R. Hook, former chairman of the partly struck Armco Steel Corp., Middletown, Ohio: "The economic consequences of the strike are more far reaching than we can see. Once full scale operations are resumed, the industry should operate at capacity for many months."

• **Bright Side?**—"In terms of dollars, this is the most unsatisfactory quarterly report we have made," declares C. M. White, chairman, Republic Steel Corp., Cleveland. But, he adds: "In terms of principles involved, we believe it is one of the best." E. J. Hanley, president, Allegheny Ludlum Steel Corp., Pittsburgh, reasons: "While our loss due to the strike is serious, it would be more costly in the long run to surrender to the inflationary wage demands of the union."

Strike Losses

(Through Nov. 2)

Lost Steelworker Wages

$1,113,000,000

Lost Sales

$3,300,000,000

Lost Production **(ingot tons)**

30,900,000

Other Losses

Overhead, depreciation, and salaries of nonproduction workers in steel.

$632,000,000

Tax Losses to U. S.

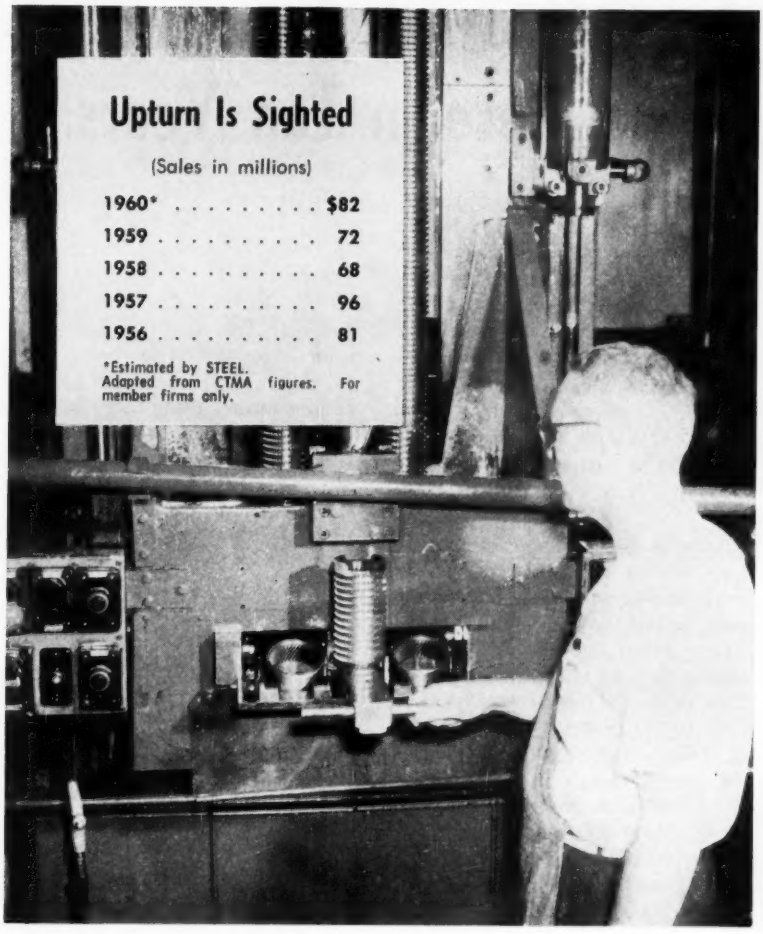
$710,000,000

Third Quarter Earnings

(In dollars)

COMPANY	1959	1958
Struck		
Allegheny Ludlum	(a)**3,913,320**	1,155,429
Pittsburgh	(a)**4,105,001**	(a)**291,638**
Republic	(a)**24,861,406**	15,184,641
U. S.	(a)**31,135,136**	74,922,924
Wheeling Steel	(a)**4,263,000**	1,842,000
Youngstown	(a)**7,149,660**	3,641,906
Partially Struck		
Armco	8,852,896	12,876,598
Copperweld	684,775	898,028
National	2,821,600	10,892,433
Operating		
Alan Wood	985,000	539,000
Atlantic	(b)610,841	(b)71,411
Carpenter	2,151,368	66,120
Continental	1,057,379	1,021,236
Detroit	2,120,414	306,533
Granite City	3,248,000	2,324,000
Lone Star	(b)6,338,902	(b)482,829
Phoenix	489,000	(a)**207,000**

(a) Loss (**Boldface**). (b) Six months.


Upturn Is Sighted
(Sales in millions)
1960* $82
1959 72
1958 68
1957 96
1956 81
*Estimated by STEEL. Adapted from CTMA figures. For member firms only.

Cutting Tool Sales Recover

Cost conscious producers turn to improved fixturization, inspection techniques and service to boost business and protect themselves against foreign intrusion

CUTTING TOOL manufacturers are looking for a 7 to 12 per cent sales pickup in 1960, following the two best quarters the industry has seen since 1957. Sales so far this year have helped stem the 50 to 60 per cent retreat in business that the industry suffered in 1958, says George N. Pophan, president of the Cutting Tool Manufacturers Association and head of Gorham Tool Co., Detroit. Price fighting flurries have also subsided among the 150 member firms of the CTMA.

• **Prospects** — The CTMA outlook also represents the fortunes of nonmember tap and drill companies and the several thousand smaller cutting tool firms scattered around the country. Total sales volume for the industry probably averages $300 million to $500 million annually, mostly from auto, farm equipment, aircraft, and appliance markets.

Cutting tools covering the removal and shaping of metal by drilling, reaming, boring, counterboring, and milling, are sold to machine tool builders as original equipment and to metal fabricators for replacement. Detroit, Cincinnati, and Dayton, Ohio, long have been industry centers, but Chicago and the West Coast are becoming more important as metalworking spreads out. Like many industries, cutting tool makers have competition from overseas. It takes two routes:

• **Indirect Competition**—Many of the smaller shops have been buying foreign tool steel for several cents a pound less than domestic producers charge. Such purchases are down now, but are expected to pick up again when steel stocks return to prestrike levels.

Quality of some of the imported steels (M-2 grades, for example) are similar to U. S. products, but analysis of much of the vanadium steel coming from France and Germany is unpredictable.

Finished goods also take an indirect toll. Leonard Skoglund, vice president, Scully-Jones Co., Chicago, asserts: "Every imported automobile or other metalworking product means one less job (needing cutting tools) that could be done in this country."

• **Direct Competition** — Overseas producers also have been shipping finished tools directly to New York and Chicago. Sold through distributors, they usually cost 10 to 20 per cent less than cutters made in the U. S. Business isn't big, but it's irritating. One Detroit company reports it has been approached by a distributor peddling British-built end mill cutters, using the trunk of his foreign car as a warehouse. Volume, obviously, is limited but quality is good and the price is $20 less than local competition charges.

So far, imports haven't been large because foreign firms have servicing and stocking problems. They find it tough to get into the special lines because of the extra leadtime needed to get job specifications, changes, and finished tools transported back and forth from Europe. Most importers offer only limited sizes of standard tools. They like to latch onto single customers who will buy in quantity.

• **Cost Conscious**—Faced with met-

alworking's common bugaboos of higher labor and material costs, plus foreign needling, manufacturers are digging deeper into costs. In the cutting tool industry, the most profitable ways to save are through improved fixturization to eliminate rejects and through better inspection methods. That's one reason optical comparators are becoming more popular in many shops. They're usually more precise than visual inspection for many jobs.

• **Suggests Better Service** — Mr. Skoglund points out that the industry can boost business and face down foreign competition by offering better service in engineering, delivery, and selection of tools.

• **Outlook** — As metalworking demands faster feeds and speeds for its tougher materials, toolmakers look for trepanning and gun drilling to become increasingly important. Steady sales increases can be expected for carbide tools as manufacturers replace older machine tools with faster modern equipment. The ceramics are naturals because they're hard to shatter at superspeeds and won't dull as quickly. Throwaway bits reduce maintenance costs on high production tools.

Age of Atomic Power To Be Here in Ten Years

COMPETITIVE atomic powerplants will become a reality within the next ten years, believes General Electric Co. By 1970, says GE, atomic facilities will be competitive with 25 per cent of the new fossil fuel plants then being installed.

"In certain areas of the country," says GE, "nuclear plants to be completed in four or five years are expected to be competitive with those areas' conventional plants."

• **Slow Overseas**—In Europe, where early wide-scale use of atomic power looked promising, a slowdown may be in the offing. Says GE: "The critical fuel shortage in Europe, which arose as a result of the Suez crisis and was a great stimulant to the Euratom program, has virtually disappeared. The location of natural gas in North Africa and oil production from the Sahara have about erased the shortage.

"But," adds GE, "just as the present condition constitutes a complete reversal of the situation of two years ago, another two years may bring a period of critical fuel shortages."

• **Which Direction?** — Among the several reactor systems being tested in the U. S., GE still feels that the boiling water reactor is the most promising. Here's why:

1. Capital equipment costs are comparatively low.
2. The system is not required to stand pressures greater than operating steam pressures.
3. Relatively large accidental changes in nuclear reactivity can be absorbed through the formation of steam voids which remove the moderator from the core.
4. Steam conditions from boiling water reactors are somewhat better than those for pressurized water systems and, in time, may well approach conventional plant pressures and temperatures.

Several other reactor systems are under study. For example, the gas cooled reactor shows promising characteristics but a breakthrough in fuels is needed.

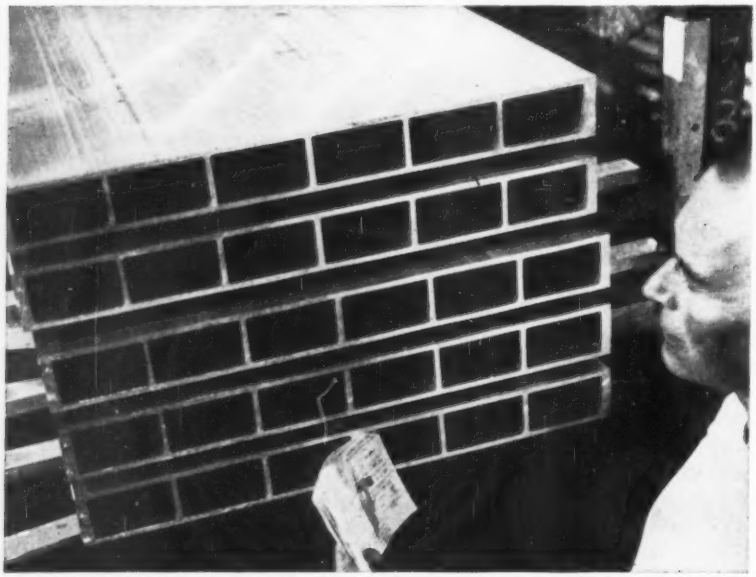
Reactors cooled by liquid metal offer a potential of good fuel economy.

Development of a workable organically cooled reactor would permit generation of high temperature steam with natural or only slightly enriched uranium.

Heavy water reactors are too expensive now. The replacement of water runs up costs.

The fast oxide breeder reactor still has a lot of bugs. The challenge of this system is that it produces more fuel than it consumes.

• **Fusion**—The future of harnessing the power of controlled thermonuclear explosions is still hazy. GE says it will take at least another three years of research to make possible a realistic appraisal of the fusion process; ten years may bring us to the point of technical feasibility; powerplant production of fusion power may come in about 20 years;



A MULTIPLE HOLLOW SHAPE, said to be the largest ever extruded, is being made by Harvey Aluminum, Torrance, Calif. Measuring 24.190 x 2.485 in., the extrusion is fabricated into a modular cabinet assembly component for an electronic control system. It is produced on a 12,000 ton hydraulic press

competitive power production lies beyond that.

• **Politics** — Of course, any timetable for an atomic program can be upset by the fickle political mind. Case in point: Just last week, former President Harry S. Truman blasted the administration's atomic program. Said Mr. Truman . . . "if you don't watch these damn Republicans, they'll give the whole thing (atomic power) away."

Hercules Branches Into New Market

INTRODUCTION by Hercules Motors Corp., Canton, Ohio, of a new line of low priced diesel engines "will create an entirely new market" for the firm, declares W. L. Pringle, president.

The new market is seen in 50 to 180 hp diesels in the line as replacements for gasoline engines in the light and medium truck class. Thev're capable of handling up to 55,000 lb gross combination weight. Design will permit fast and easy conversion, reports Hercules, with few if any changes other than the engine replacement.

The entire line ranges from 50 to 350 hp. The engines are available in three, four, six, and eight cylinder models. Three in the series are turbocharged.

• **Aluminum Too** — The heavy truck engines range from 225 to 350 hp and can handle up to 76,800 lb gross combination weight. Outstanding is a 1450 lb aluminum V-8.

Four of the new engines incorporate a combustion system featuring an auxiliary chamber inside the cylinder head which minimizes the importance of the spray pattern. A self-cleaning pintle type nozzle enables economical operation for 100,000 miles or more without maintenance or cleaning, state Hercules engineers. Almost any hydrocarbon may be used as fuel without adjustments.

In addition to the automotive market, the diesels can be used to power material handling equipment, farm tractors and implements, construction machinery, and other industrial and marine equipment.

Magnesium Usage Expected To Show Steady Climb

LOOK FOR healthy growth in the consumption of magnesium over the next decade, predicted metalmen at the Magnesium Association's 15th annual convention in New York.

• **Gains in '60**—U. S. consumption, which was only 11,947 tons in 1949, should reach around 48,000 tons this year. In 1960, U. S. industry may utilize a record 60,000 tons of primary metal, believes E. H. Perkins Jr., vice president, Brooks & Perkins Inc., Detroit.

• **More Output**—The domestic industry has the potential to turn out more metal than ever before. The nation's second domestic producer, Alabama Metallurgical Corp. (owned by Brooks & Perkins and Calumet & Hecla Inc.), will be operating at capacity (7000 tons a year) by Jan. 1. Add Dow Chemical Co.'s in-place capacity of 83,000 tons annually, and you have a U. S. capacity of 90,000 tons plus.

• **Markets**—Estimates of aluminum production are especially significant to magnesium. Here's why: About 25 per cent of all magnesium consumed is used to produce aluminum-magnesium alloys. Encouraging to marketing men is the growing popularity of the 5000 series weldable aluminum alloys (which contain magnesium).

SPECIAL PROPELLER pumps air beneath a flying platform lifting the vehicle 2 ft. The cargo carrying craft (called the Hydro-Air) is designed to travel between ports on a cushion of air. The prototype, being built by Spacetronics Inc., Washington, will be unveiled next month

Missile applications are growing in areas where weight savings are of prime concern. "Birds" like the Titan and Bomarc use large amounts of magnesium-thorium alloys. Virtually every other missile in the U. S. arsenal makes some use of the metal. "The missile market will take up a lot of the slack left by diminishing aircraft production," believes James S. Kirkpatrick, vice president, research and development, Brooks & Perkins.

But the industry has yet to develop a large tonnage market. Some magnesium men think the auto market might be the answer. So far, U. S. auto uses have been minor. Stator blades of the Chevrolet Turboglide transmission have been made of magnesium for the last two model years. Some magnesium diecastings are found in fan spacers, steering column parts, fuel pump parts, bezels, covers and housings. The Metro-lite truck body takes 400 lb of magnesium sheets and extrusions.

Technology—Here are the latest technical developments in the industry, reports H. Y. Bassett, president, Calumet & Hecla Inc.:

• New and improved alloys for such high temperature applications as jet engines and missiles.

• Improved alloying techniques, fabrication processes, and new equipment for the production of larger dimensional structural shapes.

• New techniques in welding, bonding, forming, extruding, and forging to give finished products better mechanical properties.

• Castings with increased tensile and compression strength through improvements in foundry practices and heat treatment.

• New protective coatings designed to give better protection against corrosion.

Four Ways to Save

1. **Change your fiscal year to one which ends on a date when inventory levels are closer to those at the beginning of the year. Under the tax law, a corporation may change its accounting period without prior approval of the Internal Revenue Service if, among other things, it has not sustained an operating loss in the "short" period and hasn't made such a change in the prior ten years. The return for the "short" period must be filed no later than two and one-half months after its close. Aug. 31, for example, may be selected as the end of the fiscal year, provided the corporation qualifies under the statute and the tax return is filed by Nov. 15.**

2. **Prior to yearend, acquire a business with the same kind of inventory (priced on another basis) and add this to your LIFO base.**

STEEL USERS who have been using the LIFO inventory method are in a tax dilemma. Unless they can rebuild their strike-riddled LIFO stocks by yearend (the odds are against it), they will have to pay substantial income taxes on "windfall profits" resulting from charging 1959 sales with low inventory costs from prior years.

• **Here's how LIFO (last-in, first-out) works:**

Companies using LIFO value inventory quantities at the price paid for them when they first bought them and charge materials used in production or sold to operations at the latest price paid. The last materials bought are considered to be the first ones sold or used and the first materials purchased comprise the inventory.

When prices are rising, LIFO companies show smaller profits than companies using other inventory methods and pay lower taxes because they can charge the higher current market price against operations and keep the "cheaper" prices for valuing inventories.

By keeping LIFO inventory quantities stable from one yearend to another, they can indefinitely postpone paying the tax on the difference between the LIFO inventory cost and its higher current replacement cost.

When inventories are consumed, low LIFO costs are charged against operations and the increased spread between these and current sales prices results in an extra "profit" which is fully taxable.

• **Since steel prices have been rising in recent years and many steel users elected LIFO in the early 1950s, the tax consequences of strike-imposed inventory liquidations may be substantial.**

Here's what happens when a company is able to restore depleted LIFO inventories before yearend and when it must wait until after yearend to rebuild stocks to normal levels. Inventories at the beginning of the year were 1000 tons of steel at a LIFO cost of $100 a ton. Current market is assumed to be $200 a ton.

LIFO INVENTORIES

	Rebuilt	Not Rebuilt
Profits before deducting the cost of inventory reduction or subsequent restocking	$300,000	$300,000
If the inventory is reduced by 900 tons and not rebuilt, operations are charged with the "cheap" LIFO cost of the goods consumed (900 tons @ $100)	—	(90,000)
If the inventory is completely rebuilt, operations are charged with the current purchase cost (900 tons @ $200) since there is no change in the LIFO base inventory	(180,000)	—
TAXABLE PROFITS	$120,000	$210,000
INCOME TAXES (assuming 50% rate)	$ 60,000	$105,000

The case in which the company could not restore its LIFO quantities in time resulted in $45,000 more income taxes. Further, since the company has to replace this inventory in 1960 at higher prices, it

Your LIFO

3. **Take title to finished steel in the hands of producers by being invoiced for specific quantities to be held pending receipt of shipping orders. If the company in the past has followed the policy of not including undelivered materials in LIFO inventories, including them in the year-end inventory might be disallowed by the Internal Revenue Service.**

4. **Write your congressman or Rep. Wilbur Mills (D., Ark.), chairman of the House Ways & Means Committee, Washington 25, D. C. For companies unwilling or unable to pursue the three above possibilities, the only alternative is tax relief similar to that available under wartime provisions which expired in 1955. Those provisions excluded from taxable profits the "windfall" resulting from involuntary liquidation of LIFO inventories when replacement was made in subsequent years at higher prices.**

should record on its books in 1959 a reserve (not deductible for tax purposes) equal to the difference ($90,000) between replacement cost and LIFO cost. This will properly match income and expenses by reflecting all the costs of the inventory liquidation in the period when it occurred.

The reserve provision reduces the income before taxes in the foregoing illustration to $120,000 and shows that the so-called windfall is only fiction. When base quantity liquidations are deliberate and there is no intent to rebuild stocks, the so-called windfall becomes real and no "replacement" reserve is necessary.

• Since LIFO base quantity changes are measured annually and any increase in quantities must be valued at current prices, the $100 LIFO price cannot be used to value purchases in 1960 even though inventories are restored then.

The restoration must take place in the same year as the liquidation. In short, the additional $45,000 tax for 1959 is a loss of prior years' tax postponements and cannot be recovered in the future. The company's only solace is that if and when prices fall, it may pay less taxes by liquidating inventory at LIFO prices which are then above current market.

Another headache: The company may require outside financing to pay its 1959 tax bill. Operations may not produce enough cash after set-asides for inventory replacement, plant expansion, and the like.

• Information for this article was supplied by Albert Hevey Jr. of Arthur Andersen & Co., accounting firm. An extra copy is available until the supply is exhausted. Write: Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

More Marketers Plan New Products

NEW PRODUCT planning is co-ordinated by marketing executives in 43 per cent of industrial and consumer product companies surveyed by the American Management Association's Marketing Division.

In 109 companies out of 252 surveyed, the product manager, chief sales or marketing executive, or a staff man or department reporting to sales or marketing is responsible for co-ordinating product planning. In 41 per cent of the responding firms, the co-ordination is handled at the general management level; in 11 per cent, it is directed by the head of research and development or engineering.

The survey shows a growing trend toward placing the responsibility for new product planning at the general management level, AMA says. Best results can be obtained when product planners report to top management (president, general manager, or vice president), say 61 per cent of the respondents.

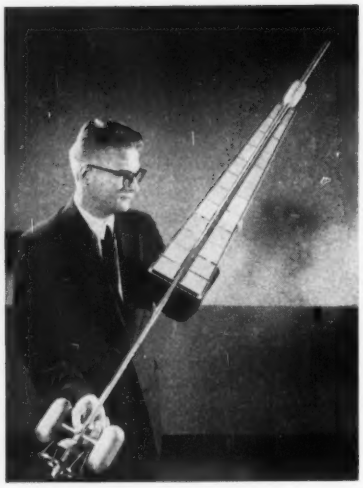
• **Committee Work** — Committees play some part in the decisions leading to new products, say 86 respondents. In some firms, the committee has sole responsibility for product planning. In others, it acts as a supplementary board for the product planners. Where committees are used, they are chaired by some member of top management in 31 per cent of the companies reporting; by a marketing executive in 17 per cent; by an R&D executive in 15 per cent; by a product planning man in 5 per cent.

Sales-initiated sources, salesmen or sales reports, are the best for product ideas, say 162 companies. The next most popular source is the research or engineering staff, as shown by responses of 148 firms.

• **Product Trends**—Industrial products companies are most concerned with developing new products to complete their lines, the survey shows. Other important objectives: Better performance, better features to build product "uniqueness" or identity, and exploitation of new materials.

Space Structures Begin Taking Shape

A chemically propelled space vehicle would need about six times more thrust of launch than an ion propelled vehicle (next photo)



NASA is seriously studying ion propelled vehicles for long journeys because they are much lighter than chemical rockets

SPACE STRUCTURES are beginning to take shape at the laboratories of the National Aeronautics & Space Administration.

• **Meteor Problem**—Several of our satellites in orbit record hits by space particles. Such information will be used in the construction of space vehicles.

NASA has found that a lead BB traveling at 160,000 mph (the speed of some space particles) releases as much energy upon impact as a stick of dynamite.

Bombardment by atoms and ions in interplanetary space (traveling 2 million mph) can also be of serious consequence — say the skin of a spaceship is designed to reflect heat, to protect occupants from sudden changes in temperature. The reflective powers of the surface would be lost on long space journeys.

• **Paddlewheel Tests**—Explorer VI (the Paddlewheel satellite) is being hit by one or two speck-size particles every 24 hours. NASA says the collisions correspond to hundreds of impacts a day on a vehicle large enough to carry one man.

Of course, there are larger particles in space—some are in the mountain category. But the chance of collision with large objects is thought to be remote.

• **Like Honeycomb Structures**—NASA is thinking of honeycomb-like structures for space vehicles. Results of impact research show: If you use two sheets for a skin, weighing no more than the one, and space them narrowly, your chances of surviving an impact are much improved. As you increase the number of sheets and widen the spaces, your chances become even better. The number of sheets and their spacing are subject to practical limitations — an efficient compromise may be four sheets separated by low density insulation, but NASA has not reached any conclusions.

• **Choice of Vehicles**—NASA scientists are also working on the overall configuration of a spaceship.

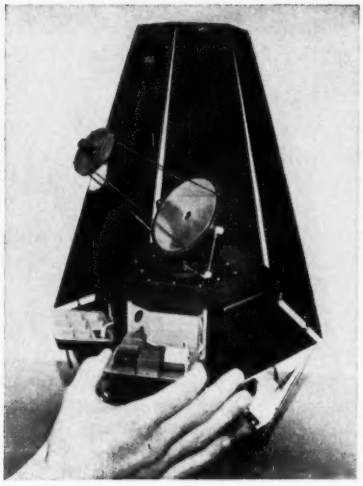
Several methods of getting the vehicles into space are being considered. One technique, assembly in space, is familiar. NASA leans toward vehicles of telescope construction, which extend to full size after launching, or inflatable type structures made of such materials as aluminum foil and a plastic film. The umbrella technique is also being studied.

• **Vulnerable Components** — Space industry executives visiting NASA's Langley (Va.) research facility last month were impressed with the attention the agency is giving to one type of spacecraft: The electric rocketship powered by ion propulsion. (Other possible propulsion systems include chemical and nuclear rockets.) The electric vehicle is particularly suited to journeys from an earth orbit to distant planets. Chemical rockets would boost the electric rocket into orbit. The electrical system is adequate in outer space because thrust requirements are greatly reduced.

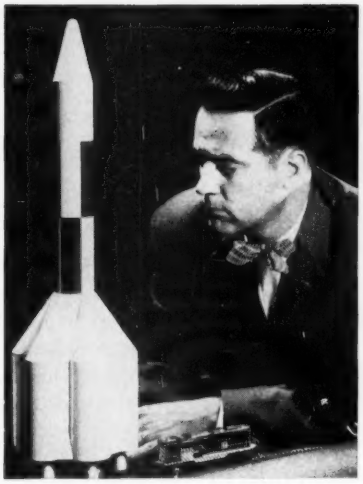
Energy would be provided by a nuclear powerplant. It would vaporize the working fluid, perhaps a liquid metal. The vapor expands to drive a generator. Unneeded energy would be radiated through large, but thin, grid structures hanging between the nuclear source and the crew's quarters.

The radiator would be one of the most vulnerable portions of the ship. For example, a tube filled with the liquid metal would explode if it

As NASA Charts Needs



This is a one-sixth scale model of a Mars payload to be carried by the Vega. The third stage would park in an earth orbit before going on to Mars



The Nova, NASA's biggest vehicle, will be ready in 1966. The smaller Saturn, just shifted from the Army to NASA, may be ready two years earlier

were punctured by a meteorite. Other problems: Shielding against radiation, creation of artificial gravity, durability of materials and the reliability of components.

• **Parking Satellites**—NASA has hit upon an idea (called the parking satellite) which may soon make up for some of our deficiencies in booster rockets. The technique may make it possible to launch payloads matching the Russians'. The second and third stages of a three-stage Vega rocket would be put into orbit by the first stage Atlas booster. At the point in the orbit where the payload would be most likely to reach the moon, the third stage would be fired. NASA estimates a 20 per cent increase in payloads is possible.

Convair Astronautics Div. of General Dynamics Corp. provides the Atlas; Atlas tank components and a General Electric Co. engine (modified Vanguard) make up the second stage. The Jet Propulsion Laboratory of NASA makes the third stage.

NASA officials are somewhat hesitant to commit themselves on how soon the Vega can be ready: The decision seems to hinge on the number of launching pads available at Cape Canaveral and the number of Atlas boosters available. "Something in the ICBM program would have to give," a spokesman said, when asked if a speedup in the program is possible.

The vehicle is expected to carry a 500 lb payload to Mars or an 800 lb payload to Venus. It could put 500 to 1200 lb into a lunar orbit, or 3500 lb into an earth orbit.

• **The Nova**—The largest rocket in the NASA scheme is Nova, which will be made up of six, 1.5 million lb thrust engines. A five or six stage vehicle would be used for a manned moon expedition. NASA believes it will take until 1964 to develop the engines, until 1966 to build the complete Nova rocket. Rocketdyne Div. of North American Aviation Inc. is developing the engine, a chemical type using kerosine and liquid oxygen which will generate temperatures of more than 5500° F.

The importance of the work on the electric rocket is evident when NASA points out that it would take only two Nova rockets to launch an ion propelled spaceship, but 12 of the Nova rockets would be needed to launch a comparable chemical powered spaceship.

• **Transfer of the Saturn** — The transfer of the Army Ballistic Missiles Agency's Saturn team to NASA is sparking some optimism in Washington. The vehicle is capable of putting 15 to 25 tons into a low orbit, probably about 300 miles high. President Eisenhower calls it our best big booster. The Defense Department and NASA have been evaluating three possibilities: The Saturn, a super-Titan (a four engine version of the present two engine Titan), and Nova. Saturn is counted better than the super-Titan, while Nova's status appears a little clouded by the switch of Saturn to NASA.

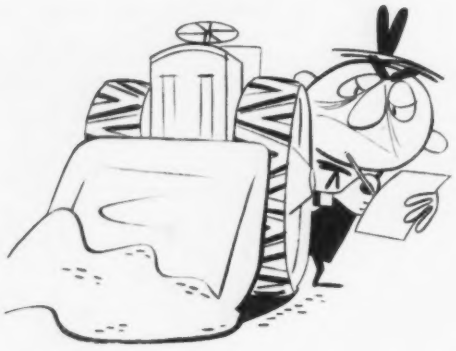
The transfer, says Herbert York, Defense's research & engineering chief, should have been made a year ago. It finally came about as an indirect result of public concern over the success of Russia's two latest space shots, both of which depended upon boosters at least twice the size of our best, the Atlas.

The Saturn will have eight Rocketdyne IRBM boosters and four ICBM boosters. We have decided to speed up the Saturn program by putting it into the hands of NASA, rather than waiting for something like Nova. Work on Vega, a much smaller vehicle, will not be affected.

• **How Soon?**—"Considerable augmentation of our space effort will result from the transfer," says Richard Horner, associate deputy director, NASA. The initial ground test of the Saturn's first stage booster will be made early next year. Only the first stage will be ready for launching by 1961. The rest of the vehicle is in the development stage. Mr. Horner sums up its mission as "manned space flight, beyond the Mercury concept."

Some $70 million is slated to be spent in fiscal 1960. Some Army officials have said they needed another $100 million. NASA will ask for more money via special appropriation when Congress returns in January. But a payload must wait until 1963 or 1964.

• This is the second of two articles on NASA's work with materials and structures. The other appeared last week. An extra copy is available until the supply is exhausted. Write Editorial Service, STEEL, *Penton Bldg., Cleveland 13, Ohio.*



Road Building Probe Set

REP. JOHN A. BLATNIK (D., Minn.) will head a road investigating subcommittee of Congress, which will probably start public hearings in January. Staff investigators—headed by a former FBI agent—are already at work.

The special subcommittee promises a thorough investigation of the whole federal highway program. Complaints about methods of route acquisition, overdesigning, too much spending, and other forms of waste will be probed. Hearings may be staged throughout the country.

Rep. Wilbur Mills (D., Ark.) head of the House Ways & Means Committee, reports a subcommittee of that group will also look into the interstate program: Utilization of the trust fund money and administration of the program will be studied.

Basic Question: Why a Slowdown?

A basic question is behind the two investigations: Why was the program forced to slow down?

Lack of money is the obvious answer, but like most Washington problems, you must seek an answer beyond the obvious. Here are a few of the facts the two Congressional committees will be analyzing:

• Expenditures through fiscal 1960 will exceed those contemplated when the federal program was established in 1956. The difference: About 20 per cent.

• Highway user taxes (state, not federal funds) are being used for nonhighway purposes. The National Highway Users Conference estimates that in 1957 a potential 3939 miles of highway were lost because of such diversion. Example: Driver's licenses and motor vehicle registration fees are being diverted to build schools in some states.

• Traffic forecasts made when the interstate system was planned (and subsequent estimates) have not proved accurate.

• No one, especially the Commerce Department, has been anxious to solve the problem of how to equitably allocate the costs of the highways. For example, if the system has a defense capability, shouldn't some of the funds for it come from the Defense Department?

• The government's financial watchdog, the General Accounting Office, says states do not uniformly estimate their highway costs.

• States' programs do not show uniform progress.

• A hassle between highway and transit circles is brewing. The dispute: Possible use of federal highway median strips (particularly within urban areas) for rapid transit. (This points up the lack of any over-all transportation plan by the federal government.)

• Just about everyone connected with the program admits it is not a case of finishing it by 1972 or any target date, but a case of a continuing necessity for highway improvement to keep pace with automobile and truck traffic requirements.

Simpson Endorses New DLF Policy

A bomb was dropped on the State Department last week by the Development Loan Fund: It wants a "maximum" amount of goods purchased with DLF money to come from U. S. firms. Perhaps half the funds have been going to foreign manufacturers.

Washington generally regards the move as a Treasury Department victory over the State Department. The liberal trade group, the Committee for a National Trade Policy, immediately claimed the ruling would raise the cost of U. S. loans. It charged: "The U. S. is relaxing the pressure on U. S. producers to remain competitive in world markets."

Rep. Richard H. Simpson (R., Pa.) commented: "The government has increased its purchases of foreign products at a time when foreign countries, which we have helped and are helping financially, pursue policies of rank discrimination against U. S. products."

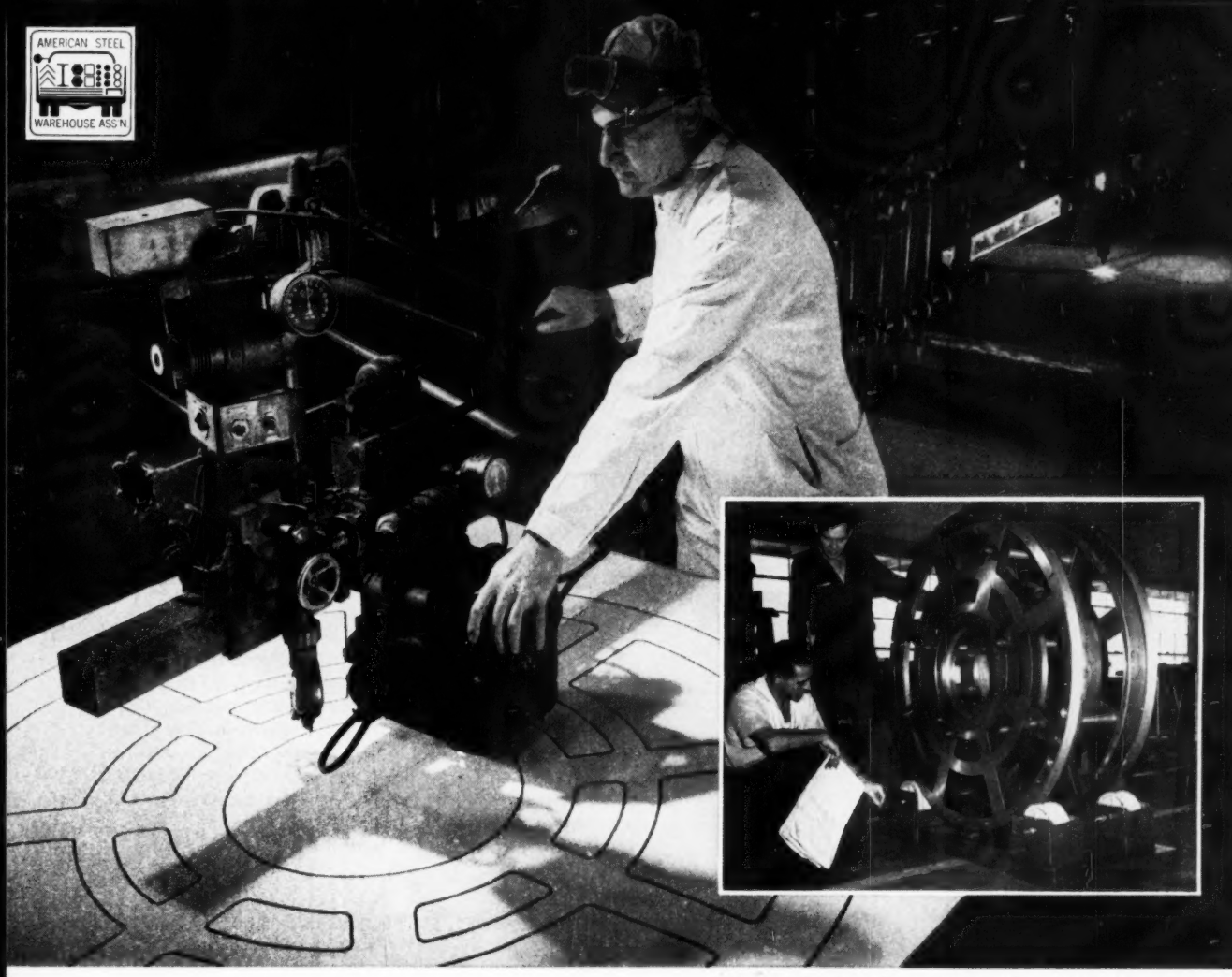
He wants an "over-all government policy" in this area.

ICA, TVA, Army Should Buy American

Representative Simpson, ranking Republican on the House Ways & Means Committee, reported that the International Co-operation Administration (which spends about $500 million a year) has also been asked by the Treasury to cut down foreign purchases.

Noting that the Tennessee Valley Authority has spent three times as much for foreign goods in the last fiscal year as it did during the preceding 25, he recommended that Congress should require the TVA (as well as the Army) "to place greater emphasis on the purchase of American products—including heavy electrical machinery."

He left no doubt about where he stood on the situation in turbines. "This perhaps is the most glaring example of a government agency working against our best interests as a nation."



Precision electronic-eye flame cutting on this multiple welder component saved many costly hours by eliminating virtually all subsequent machining.

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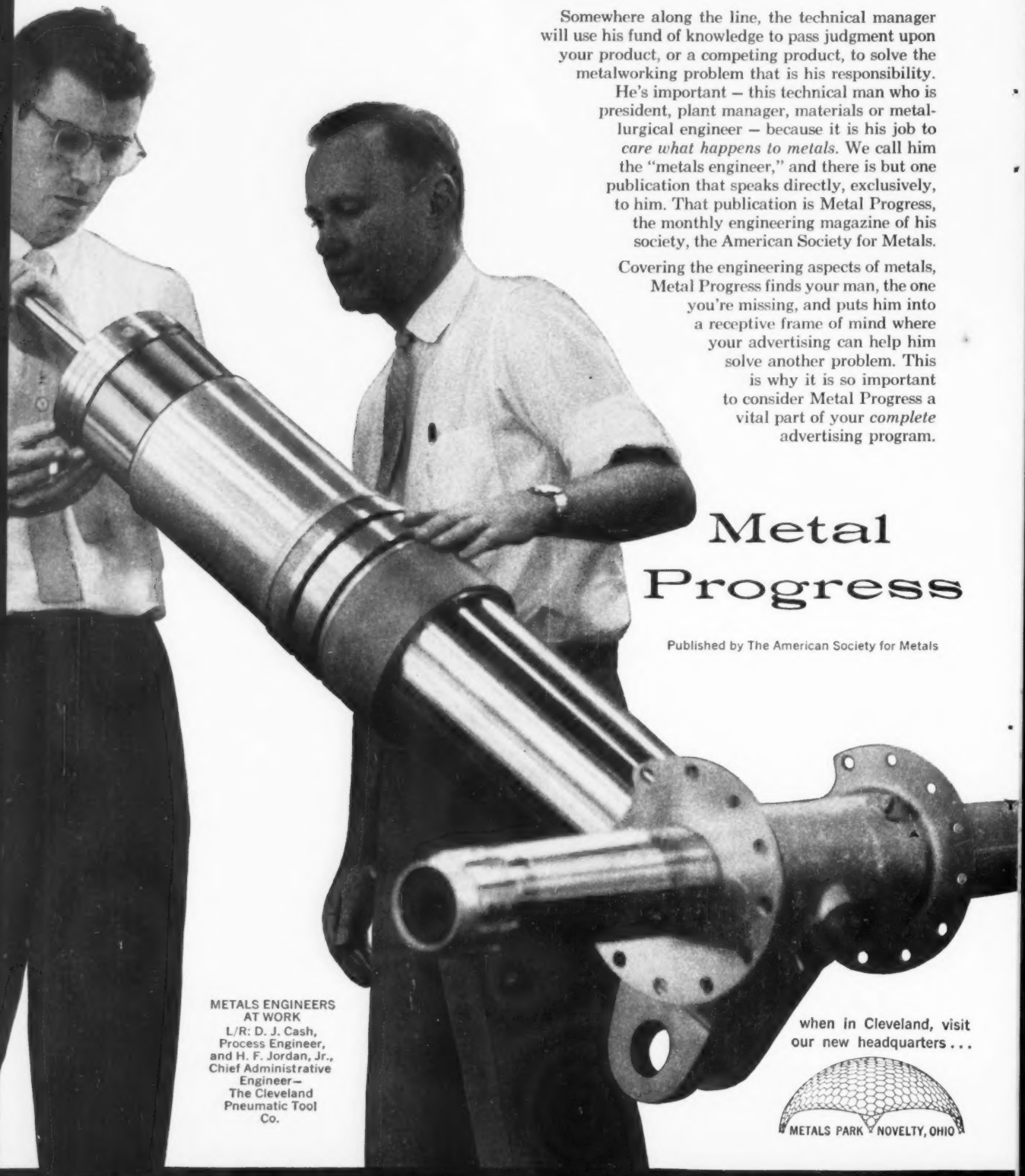

Somewhere along the line, the technical manager will use his fund of knowledge to pass judgment upon your product, or a competing product, to solve the metalworking problem that is his responsibility. He's important – this technical man who is president, plant manager, materials or metallurgical engineer – because it is his job to *care what happens to metals.* We call him the "metals engineer," and there is but one publication that speaks directly, exclusively, to him. That publication is Metal Progress, the monthly engineering magazine of his society, the American Society for Metals.

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How to Keep Good Men from Quitting

YOUR COMPANY may face a serious shortage of technical, managerial, and skilled personnel in the coming decade. Demand for such men will be overwhelming, but supply will be meager (see STEEL, Oct. 26, p. 96).

Result: You will be forced into a furious battle to keep the men you have (raiding will run rampant). And you may find you have to make better use of their time.

Another problem: It'll be tougher than ever to thwart union organizing attempts; engineers have become a prime subject for organized labor. The American Federation of Technical Engineers, for example, is spending 55 per cent of its budget for organizing efforts, has chartered ten new locals in the last year.

Here are some approaches to such problems that have proved successful:

• **Avoid Duplication**—Evaluate the paperwork that flows across each man's desk. Objective: Minimize duplication of work at different levels in the vertical organization. Ask: Is it necessary that so many people see every memo, or report, or worksheet? And have each manager ask himself: Could this function be delegated? And find out if one department is duplicating the work of another. That happens frequently in a fast growing organization. Also check to see if regional offices (or the home office) are duplicating the work of local offices.

• **Appraise Your Men** — You can motivate a man to new heights by showing him that management is interested in his progress. So try appraising each man's performance at least once a year. The formal appraisal should be developed by his supervisor and approved by higher management. It should be played back to the man by his supervisor at a counseling session. Strong points should be commended and a mutual plan found to help correct weaknesses. At the same time, a projection of potential should be made so that company plans for special training or guidance can be crystallized. (This portion is usually not played back to the individual.)

• **Public Recognition**—Always give a man publicity, at least within the company, for outstanding accomplishments (such as improved

(*Please turn to Page* 52)

20 ways to lose a good employee . . .

1. **Give him work that's not challenging.**
2. **Never tell him that he's doing a good job.**
3. **Don't point out opportunities for advancement.**
4. **Oversell him when you recruit him.**
5. **Pay him less than he's worth.**
6. **Discourage self-improvement.**
7. **Remind him frequently of all minor miscues.**
8. **Never point out major errors.**
9. **Don't keep him informed on company matters.**
10. **Fail to set up clear channels for suggestions.**
11. **Force him to work in a noisy, poorly lighted area.**
12. **Ignore personality clashes in job placement.**
13. **Give general wage hikes rather than merit increases.**
14. **Keep top management's door closed to the employee.**
15. **Always question his expense account.**
16. **Put the idea man in an administrative post, the detail man in a creative job.**
17. **Fail to define a man's job or the expected results.**
18. **Force him to overspecialize.**
19. **Block his participation in professional societies.**
20. **Don't train him.**

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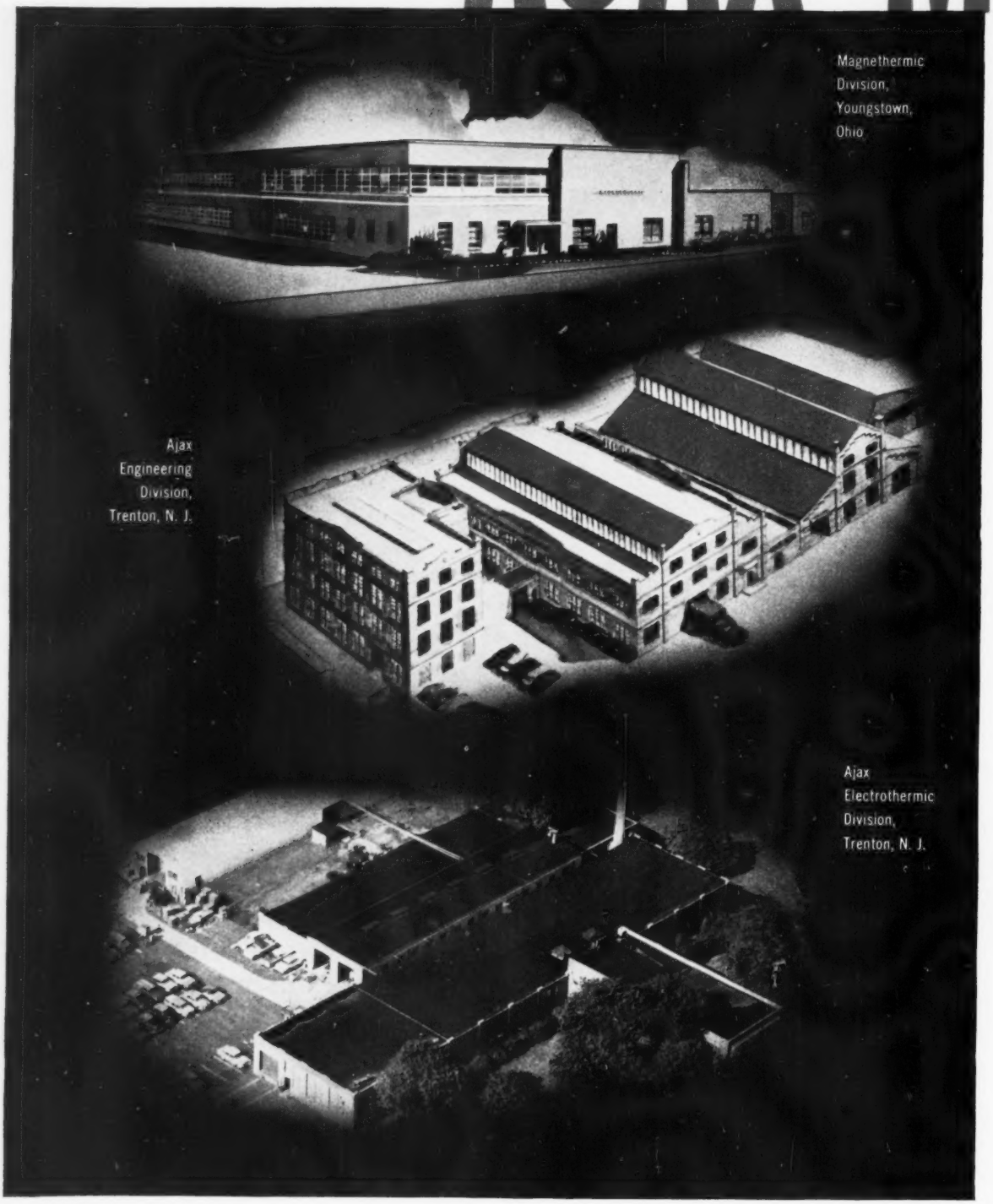

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New in name but rich in tradition and experience . . . that's Ajax Magnethermic. The men who did much of the original pioneering work in induction heating—Northrup, Wyatt, Clamer—founded or were associated with the companies who joined together this year to form Ajax Magnethermic Corporation.

This new name combines three old names in the business—Ajax Engineering Division, pioneers in 60 cycle melting; Ajax Electrothermic Division, pioneers in high-frequency melting; and Magnethermic Division, pioneers in induction billet heating.

This old, "new" company now offers the most complete line of induction heating equipment, the most experienced staff, and largest facilities of any company in the business. When you have a heating or melting application and want guidance and unbiased recommendations, consult Ajax Magnethermic. Our only business is the design, engineering and manufacturing of induction heating equipment for heating and melting.

John A. Logan
PRESIDENT

Induction Heating is our ***ONLY*** *Business*

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Conflict: MANAGER vs. ENGINEER

A MAJOR STUDY just completed by Opinion Research Corp., Princeton, N. J., gives you some important clues to the causes of tensions between a company's management and its technical personnel. ORC interviewed in depth 622 scientists and engineers (half have advanced degrees) and 105 managers (department heads to top officers) in scientifically minded companies noted for advanced personnel practices. ORC concluded: The problem is not salaries, benefits, and working conditions; it's the conflict of interest between the management mind and the scientific mind. Of the scientists and engineers . . .

- . . . 70 per cent say management oversimplifies problems.
- . . . 76 per cent say management tries to manipulate people for its own purposes.
- . . . 70 per cent say management makes decisions based on limited information.
- . . . 73 per cent say management is mostly concerned about the short range payoff.
- . . . 83 per cent say their talents are channeled too closely to what is proved and profitable.
- . . . 77 per cent say their talents are poorly utilized by management.
- . . . 78 per cent say company practice often forces them to overspecialize.
- . . . 82 per cent say management doesn't provide enough freedom for creativity.
- . . . 80 per cent say experienced engineers and scientists are generally underpaid.
- . . . 8 per cent say engineers and scientists are among the most highly respected people in the company.
- . . . 67 per cent say getting ahead in top management is based more on politics than knowledge.
- . . . 21 per cent say top management gives continuous sustained support to their new ideas.
- . . . 79 per cent reject unions for scientists and engineers.
- . . . 68 per cent would still choose the same career if they had it to do over again.

(*Continued from Page* 49)

techniques, money saving ideas, inventions or patents).

• **Educational Opportunities**—Says Westinghouse Electric Corp.'s M. L. Burgess: We've found it particularly important to provide opportunity for advanced degrees, or classes which become a tool of a man's career, or, in many cases, courses which broaden a man's basic background (such as business subjects for an engineer). Westinghouse and other firms pay half the tuition upon satisfactory completion of a course, and the other half when a degree is awarded.

• **Chart vs. Function** — There's a trend toward discarding traditional organizational charts. The theory: You should organize your efforts, particularly in engineering, around the capabilities of individuals rather than around some preconceived chart which has no regard for the abilities, aspirations, and desires of professional personnel. Such a move allows advancement, in salary and status, for the man who would rather continue in his specialty than shift to the management field.

• **Salaries** — Authorities agree that high wages alone won't prevent good men from quitting. And they believe that pay is seldom the most important factor in motivating men to produce more. But they emphasize that a man making below average wages will more readily find other dissatisfactions with his job. A Northwestern University survey of 205 companies finds these average monthly salaries five and ten years after graduation:

	After Five Years	After Ten Years
Engineering	$651	$806
Accounting	618	839
Sales	683	924
General business	638	861

• **Testing**—You can use tests to make better use of your people. Recommended are tests: 1. To

select and place new employees. 2. To promote and relocate present employees. 3. To find the right people to train. 4. To inventory your present manpower. (Armstrong Cork Co. is one of the firms doing this.) 5. To determine employee reactions to pay, benefits, security, opportunity, work pressure, workload, management confidence, effectiveness.

To determine what test will give you the results you're seeking, contact the American Psychological Association, Washington.

• **Organizing for Efficiency**—The National Society of Professional Engineers believes you can slash administrative and clerical costs and boost efficiency this way: Centralize top level engineering. Then decentralize ground level work into departments with comprehensive standard practices and specifications. Clearly define authority and responsibility so engineers know exactly what their responsibilities are and to whom they are accountable. You may increase efficiency by decreasing the number of engineers per supervisor. Try establishing a planning group to take over estimating, scheduling, and budget control for all projects, allowing the engineers to devote more time to purely technical work.

• **Work Environment**—Ask yourself these questions ("It's surprising how frequently engineers complain of these conditions," concludes a Harvard study group): Is the noise level too high? Is there too much traffic around the man's work area? How is the temperature? Humidity? Power supply? Communication facilities? Lighting? (The Illuminating Engineering Society recommends 200 foot-candles for designing and detailed drafting; 150 foot-candles for accounting, auditing, business machine operation, and rough drafting; 100 foot-candles for general officework.)

• This is the second article in a series of four on the manpower shortage and how to meet it. The Oct. 26 article pointed out positions which are (and will continue to be) hardest to fill. The Nov. 9 article will deal with exploiting new sources of supply. The Nov. 16 article will show you how to upgrade recruiting and training programs. An extra copy of each article is available until supply is exhausted. Write: Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

Personnel Raiding Looms Again . . .

THE PRESIDENT of an Illinois metalworking firm pulled a letter from his desk drawer. Addressed to the comptroller, it read:

"We know of four openings for comptrollers in the $22,000 to $41,000 salary range. The positions are with progressive companies in growth industries. We thought you might know of a colleague who would be interested in investigating one of the opportunities."

The letter was signed by a partner of a well known executive placement firm. The man who received it made $19,500 yearly. "Obviously, this recruiter tried to raid our man," stormed the company president. "Fortunately, our comptroller is loyal and realized that the recruiter had him in mind for a job in the lower end of the salary range mentioned. So he gave me the letter. But this is the type of competition I'm up against to hang onto my management team. And the pressure for some engineers is even worse."

• **Chop Chop**—Companies are going to enormous—and sometimes ridiculous—lengths to obtain managerial and technical talent. An aircraft firm, for example, passed out cookies at a West Coast meeting attended by large numbers of engineers. When the engineer bit into a cookie, a slip of paper stuck between his teeth. On it was printed "Opportunities unlimited at (name)."

But your men don't have to be given fortune cookies to be lured into examining job openings. Compare the help wanted columns of your newspaper today with those of early 1958. You'll find that the volume of openings for managerial, technical, and skilled personnel is substantially higher today.

• **Everybody's Looking**—Heidrick & Struggles Inc., Chicago executive recruiting firm, compiles an index based on the number of management openings advertised in major metropolitan areas. Here is a comparative study (1955-56 equals 100):

Type of executive	Today	Mid-1958
Manufacturing	135	50
General engineering	80	40
General administration	175	85
Financial	155	80
Marketing	90	70
Personnel	180	50

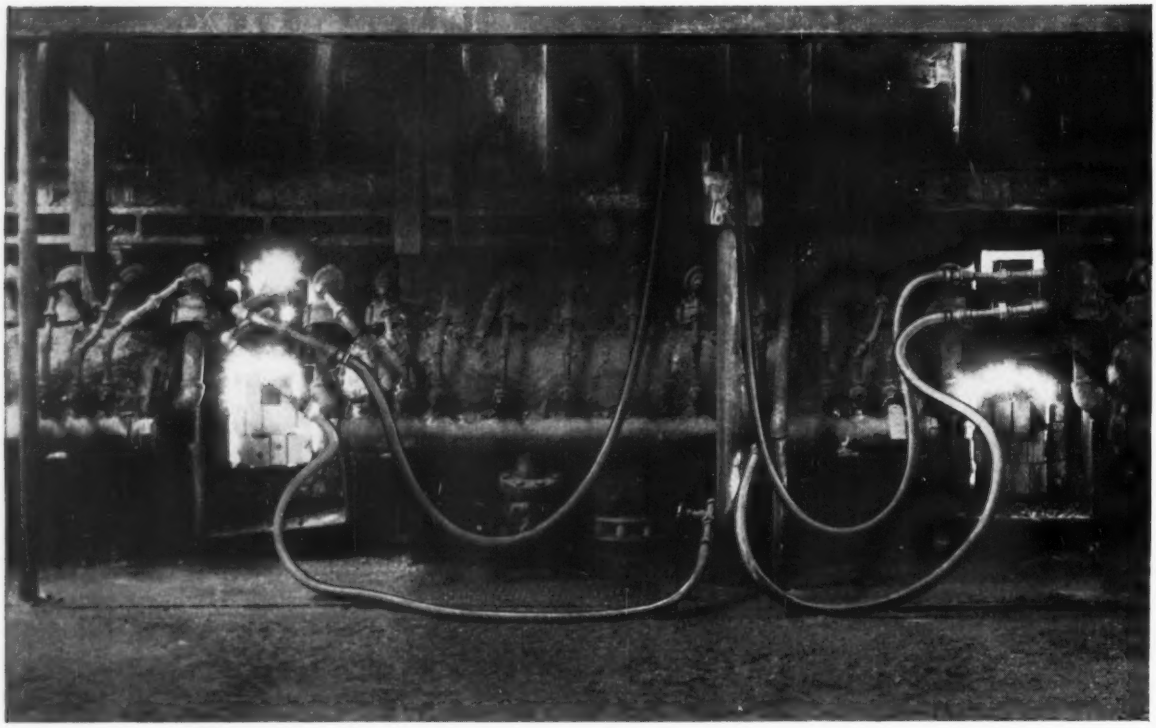
*Figures are approximate.

• **Everybody Pays**—Hoff, Canny, Bowen & Associates, New York executive placement firm, points out that raiding is costly to everyone involved. For the firm being raided, it means the loss of a good employee. For the raiding firm, it may mean spending $5000 to more than $20,000. HCB notes that some companies will invite numerous men to their offices for interviews. Expenditures include transportation, lodging, meals, and the time of highly paid executives who do the interviewing. Many of the "job candidates" really aren't looking for a new job; they just like an occasional trip at someone else's expense.

• **Conclusion**—The rebirth of raiding means it'll be tougher to hold your top talent. Alert metalworkers are figuring out ways to do that now. Salary boosts aren't always the answer.

PEERLESS WATER HOSE

BIG STEEL MILL DEPENDS on U.S. PEERLESS WATER HOSE to prevent pipe skid burn



In the Fretz-Moon furnace of this Kaiser Steel Mill in Fontana, Calif., one length of U.S. Peerless® Water Hose ("the hose with the good brown cover") carries cold water to the pipe skids, another length carries the return hot water—up to 200° F. If the hose should fail or kink, the pipe skids would burn up and costly repairs and downtime would follow.

Kaiser Steel depends on Peerless to safeguard valuable skids and keep its pipe mill in operation. U. S. Peerless is part of the complete line of U. S. Rubber's industrial hose, engineered for use and abuse.

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CHEVROLET													
Corvair 500†	$2,038	108 in.	180 in.	51.3 in.	2,340	80/4,400	140 cu in.	8:1	$145.80	N/A	N/A	$53.80	$74.25
Biscayne†	2,316	119	210.8	56	3,570	135/4,000	235	8.25:1	188.30	$75.35	$43.05	53.80	46.85
Bel Air	2,545	119	210.8	56	3,575	170/4,200	283	8.5:1	188.30	75.35	43.05	53.80	74.25
Impala	2,697	119	210.8	56	3,580	250/4,400	348	9.5:1	209.85	75.35	43.05	53.80	74.25
PONTIAC													
Catalina	2,702	122	213.7	56.6	3,935	215/3,600	389	8.6:1	231.34	107.50	43.00	88.77	75.32
Star Chief	3,003	124	220.7	56.6	3,995	215/3,600	389	8.6:1	231.34	107.50	43.00	88.77	94.15
Bonneville*	3,331	124	220.7	54.8	4,065	281/4,400	389	8.6:1	231.34	107.50	43.00	124.82	94.15
OLDSMOBILE													
Series 88	2,900	123	217.6	56.1	4,109	240/4,400	371	8.75:1	231.34	107.50	43.00	88.77	75.32
Super 88	3,176	123	217.6	56.1	4,128	315/4 600	394	9.75:1	231.34	107.50	43.00	88.77	75.32
Series 98	3,887	126.3	220.9	56.1	4,353	315/4,600	394	9.75:1	231.34	107.50	43.00	124.82	97.38
BUICK													
Le Sabre	2,870	123	217.9	57.2	4,219	250/4,400	364	10.25:1	220.38	107.50	43.00	98.90	98.90
Invicta	3,357	123	217.9	57.2	4,324	325/4,400	401	10.25:1	Std	107.50	43.00	98.90	98.90
Electra	3,856	126.3	221.2	57.5	4,544	325/4,400	401	10.25:1	Std	Std	Std	134.45	98.90
CADILLAC													
Series 62*	5,080	130	225	56.2	4,805	325/4,800	390	10.5:1	Std	Std	Std	164.60	128.70
60 Special*	6,233	130	225	56.2	4,880	430/3,100	390	10.5:1	Std	Std	Std	164.60	128.70
Fleetwood 75	9,533	149.8	244.8	59.3	5,475	430/3,100	390	10.5:1	Std	Std	Std	246.60	178.50
FORD													
Falcon†	1,974	109.5	181.1	54.5	2,395	90/4,200	144.3	8.7:1	159.40	N/A	N/A	54.05	67.80
Fairlane†	2,311	119	213.7	55	3,706	145/4,000	223	8.4:1	179.80	76.50	43.20	58.50	46.90
Fairlane 500	2,401	119	213.7	55	3,710	185/4,200	292	8.8:1	189.60	76.50	43.20	58.50	46.90
Galaxie	2,716	119	213.7	55	3,734	235/4,400	352	8.9:1	211.10	76.50	43.20	58.50	75.10
EDSEL Ranger†	2,613	120	216.4	55	3,658	145/4,000	223	8.4:1	189.60	81.80	43.25	64.95	74.45
MERCURY													
Monterey	2,730	126	219.2	55.7	3,981	205/4,000	312	8.9:1	231.30	106.20	43.20	86.00	78.70
Montclair	3,280	126	219.2	56	4,255	310/4,100	430	10.1:1	Std	106.20	43.20	86.00	78.70
Park Lane*	3,858	126	219.2	56	4,380	310/4,100	430	10.1:1	Std	Std	Std	86.00	78.70
LINCOLN													
Lincoln	5.441	131	227.2	56.7	5,016	315/4,100	430	10:1	Std	Std	Std	Std	Std
Premiere	5,945	131	227.2	56.7	5,072	315/4,100	430	10:1	Std	Std	Std	Std	Std
Continental	6,845	131	227.2	56.7	5,157	315/4,100	430	10:1	Std	Std	Std	Std	Std
VALIANT† V-100	2,053	106.5	184	53.3	2,635	101/4,400	170	8.5:1	169.81‡	72.63‡	40.34‡	58.32‡	74.35‡
PLYMOUTH													
Savoy†	2,310	118	209.4	54.6	3,365	145/4,000	225	8.5:1	191.80	76.60	42.60	58.50	74.40
Belvedere	2,559	118	209.4	54.6	3,520	230/4,400	318	9:1	189.10	76.60	42.60	58.50	74.40
Fury	2,694	118	209.4	54.6	3,550	310/4,800	361	10:1	210.70	76.60	42.60	84.30	74.40
DODGE													
Dart Seneca†	2,335	118	208.6	54.8	3,420	145/4,000	225	8.5:1	191.80	76.60	42.60	58.50	74.40
Dart Pioneer	2,583	118	208.6	54.8	3,610	230/4,400	318	9:1	189.10	76.60	42.60	58.50	74.40
Dart Phoenix	2,719	118	208.6	54.8	3,610	255/4,400	318	9:1	210.70	76.60	42.60	58.50	74.40
Matador	2,935	122	212.6	54.9	3,725	295/4,600	361	10:1	189.10	76.60	42.60	58.50	74.40
Polara	3,146	122	212.6	54.9	3,735	325/4,600	383	10:1	210.70	76.60	42.60	95.65	74.40
DE SOTO													
Fire Flite	3,017	122	215.4	55	3,865	295/4,600	361	10:1	226.90	106.30	42.60	88.90	97.80
Adventurer	3,579	122	215.4	55	3,895	305/4,600	383	10:1	Std	106.30	42.60	105.90	97.80
CHRYSLER													
Windsor	3,194	122	215.4	54.9	3,815	305/4,600	383	10.1:1	226.90	107.60	43.50	99.80	101.90
Saratoga	3,929	126	219.4	55.2	4,010	325/4,600	383	10.1:1	Std	Std	Std	124.10	101.90
New Yorker	4,409	126	219.6	55.6	4,145	350/4,600	413	10.1:1	Std	Std	Std	141.40	101.90
IMPERIAL													
Custom	5,029	129	226.3	56.7	4,700	350/4,600	413	10.1:1	Std	Std	Std	153.30	136.30
Crown	5,647	129	226.3	56.7	4,770	350/4,600	413	10.1:1	Std	Std	Std	153.30	136.30
Le Baron	6,318	129	226.3	56.7	4,860	350/4,600	413	10.1:1	Std	Std	Std	168.80	136.30
RAMBLER													
American De Luxe†	1,884	100	178.3	57.3	2,475	90/3,800	195.6	8:1	178.50	69.50	N/A	57.70	72.00
Custom Six†	2,383	108	189.5	57.3	2,950	127/4,200	195.6	8.7:1	199.50	69.50	37.95	75.65	76.00
Rebel V-8	2,398	108	189.5	57.2	3,290	200/4,900	250	8.7:1	219.50	79.50	37.95	75.65	76.00
Ambassador	2,587	117	198.5	56.9	3,430	250/4,700	327	8.7:1	229.50	89.50	39.95	91.90	82.50
STUDEBAKER													
De Luxe Lark†	2,046	108.5	175	57.5	2,605	90/4,000	169.6	8.3:1	199.50	N/A	37.66	56.64	71.00
Regal Lark 8	2,331	108.5	175	57.5	2,924	180/4,500	259.2	8.8:1	199.50	74.50	37.66	63.82	71.00

Prices include federal excise tax, suggested handling, and distribution charges. State and local taxes, transportation charges, and accessories are not included. Alternate accessory and V-8 options are shown for most models. *Indicates hardtops. †Six cylinder models. Specially priced Ford, Chevrolet, and Pontiac Ventura lines are not shown. N/A indicates not available. ‡Approximate.

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Verdict on '60 Cars Awaited

Automakers will check first run sales against their hopeful forecasts. Next year could see metalworking embarked on new round of record production and sales

IN ABOUT A MONTH, Detroit will have enough sales reports to tell whether or not its rosy predictions for 1960 will be fulfilled. Early registrations should answer Motordom's big question—will the economy cars sell as well as marketers anticipate. If they do, the auto industry will lead the way into what metalworking believes will be the soaring sixties.

Carbuilders already have predicted sales of 7 million units for next year. George Hitchings, Ford Motor Co.'s chief economist, says pent-up demand from 1958 (and the steel strike) could shove sales over 7 million. Ford car sales for the first ten selling days after introduction already are 23 per cent ahead of last year's figures for a like period.

Dealers have ordered half a million Fairlanes, Galaxies, and station wagons, and 97,000 Falcons for delivery before Jan. 1.

Looking farther into the '60s, William F. Hufstader, vice president in charge of General Motors' distribution staff, says rising standards of living and increased purchasing power will put 100 million motor vehicles on the highways by 1970. That's three cars for every two on the road now, declares Mr. Hufstader. Robert J. Eggert, Ford's market research manager, agrees. He foresees the new car market growing at a rate of 2.8 per cent per year. Annual sales should be averaging 10 million units by 1975, he adds.

Third quarter earnings, meanwhile, indicate that this year won't turn out too badly unless steel shortages curtail last quarter sales. Studebaker-Packard Corp. shows net earnings of $3.3 million for the third quarter; $15.4 million for the first nine months of 1959. Last year, S-P showed a nine month loss of $22.5 million. Ford Motor Co.'s nine month earnings total $339.1 million compared with $1.2 million last year. Chrysler Corp.'s net earnings for nine months are $23.8 million vs. a net loss of $45.2 million in 1958.

Aluminum Muffler Ready

Centr-O-Cast & Engineering Co., Detroit, and Reynolds Metals Co. have developed a cast aluminum muffler. It's expected to be in limited use by the end of 1960. L. W. Wickson, Centr-O-Cast president, says it weighs only 60 per cent as much as conventional mufflers and claims it is competitive in cost.

The muffler looks somewhat like a section of a steam radiator. It's designed to minimize internal condensation which is the prime destroyer of today's units. It's made in two halves which can be unbolted for inspection and repair.

Because the muffler is cast, the design can be easily adapted to fit any type of frame and body construction. Since carbuilders often must come up with 30 or more different muffler designs for a single line of cars, that alone provides opportunity for considerable savings.

U. S. Auto Output

Passenger Only

	1959	1958
January	545,757	489,515
February	478,484	392,132
March	576,085	357,048
April	578,825	316,594
May	546,817	349,613
June	557,994	337,446
July	555,418	321,017
August	239,152	180,447
September	258,157	130,460
9 Mo. Totals	4,336,689	2,874,272
October		261,701
November		514,152
December		593,920
Total		4,244,045

Week Ended	1959	1958
Sept. 26	91,341	42,599
Oct. 3	105,720	34,464
Oct. 10	118,793	34,834
Oct. 17	133,480	45,387
Oct. 24	111,120†	70,973
Oct. 31	100,000*	97,804

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

How Safe Is Your Car?

For the fifth consecutive year, the National Vehicle Safety Check reveals that one out of every five vehicles needs maintenance to put it in a safe driving conditon. Rear lights need most service attention, reports the Inter-Industry Highway Safety Committee, which does the annual survey.

In order of importance, other items most frequently found in unsafe condition are front lights, brakes, exhaust systems, and tires. Although taillights have been the prime offender for the last five years, this is the first time since 1954 that defective front lights have had a greater incidence than brakes. The committee checked over 3 million cars in 2284 cities in making its 1959 survey.

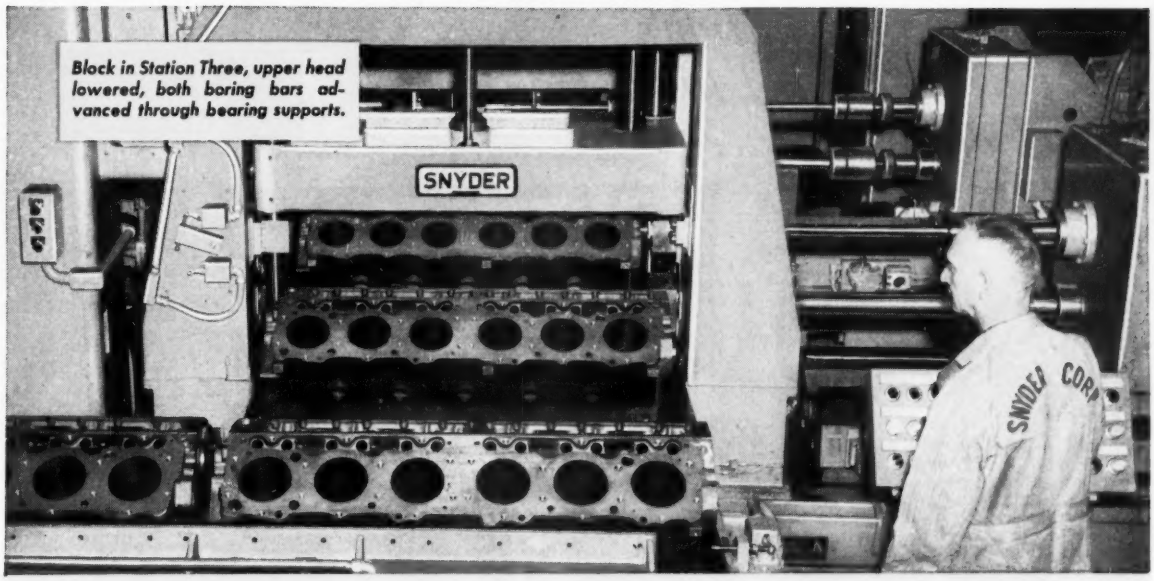
Exhaust Notes

• Prenco Mfg. Corp., Royal Oak, Mich., is offering a rental unit for production line impregnation of certain types of aluminum automotive castings. Leasing costs are deductible as manufacturing or operating expenses.

• Chrysler Corp. plans to build a multimillion dollar transmission and rear axle plant near Syracuse, N. Y., containing 400,000 sq ft. Zoning changes are delaying the project. Construction should take less than a year. The plant will employ about 1250 persons.

• Ford's Aeronutronic Div. has been awarded an Army research contract to investigate the practicality of using its air cushion development for military vehicles that could operate over varying types of terrain. Although the principle is similar, the study is not related to the development of Ford's Levacar which travels without wheels on a thin film of air.

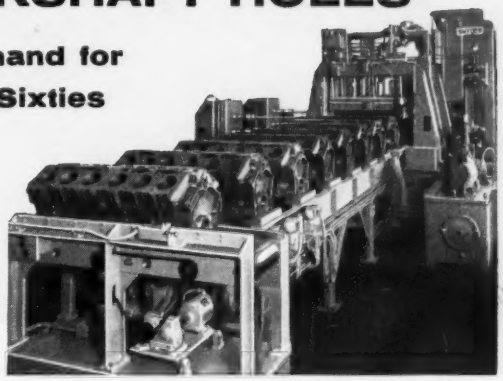
• Aluminum Co. of America estimates the auto industry will use 55.1 million lb of aluminum this year. In 1958, the industry used 38.4 million lb, vs. 31.2 million lb in 1957 and 17.6 million lb in 1956.



Block in Station Three, upper head lowered, both boring bars advanced through bearing supports.

PRECISION BORING OF 42″ LENGTH CAM AND CRANKSHAFT HOLES

SNYDERIZING Meets the Demand for Quality Parts for the Soaring Sixties



This 12-cylinder block is for heavy duty truck and marine engines aimed at taking a bigger bite of this booming market. Our Snyder special 7-station machine is helping this manufacturer SNYDERIZE for the Soaring Sixties by providing boring tolerances which make his product outstanding.

In regular production at a rate of 31 pieces per hour, main and camshaft bearing holes are rough and semi-finish bored simultaneously with all diameters held to manufacturers' specifications for alignment, roundness and concentricity. The distributor hole is also semi-finish bored in this machine to establish proper location to cam and crank bores.

Advanced engineering, both in product and production machines, is the best possible preparation for the competition of the next decade. We'll be happy to show you, too, how to SNYDERIZE for the Soaring Sixties to gain more efficient parts handling, gaging, assembly and machining. Write or phone for new brochure on machines for profit improvement.

Standard Features of Snyder Machines

1. SNYDER UNITS equipped with hardened and ground steel ways.
2. Building block principle throughout.
3. Automatic lubrication.
4. Walking beam transfer bar.
5. J.I.C. Standards throughout.
6. Electrical interlocks and full depth circuit throughout.
7. Panels equipped with SNYDER CIRCUIT SLEUTH.

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(Formerly Snyder Tool & Engineering Company)

3400 E. LAFAYETTE—DETROIT 7, MICHIGAN
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Now the nation's third largest steel plate producer

Left to right: George Copeland, Manager of Lukens' newly consolidated Sales Service Division, with department heads Arthur Powers of Customer Service, and Richard Slider of Order Processing.

LUKENS STREAMLINES ITS CUSTOMER SERVICES

The demanding process of making quality steel plate can't be rushed. But Lukens *has* cut the time it takes to process your orders and answer service inquiries.

In our *Customer Service Dept.*, for example, quotations, order status information, and similar requests are now handled by five area supervisors, each with a specific geographic territory to serve. All five are located in Coatesville. They and their staff members are ready to supply detailed information on any and all Lukens products —*promptly* through our sales offices.

Result: shortened lines of communication . . . faster action . . . greater customer satisfaction.

Equally important, our *Order Processing Dept.* has also been re-shaped. This one department now handles all orders for Lukens' full range of plate and fabricated products.

Streamlining our entire service organization was a logical complement to Lukens' "Phase A" expansion objectives: *new capacity and quality levels to meet the growing needs of our plate fabricating customers.*

Lukens Steel Company, Coatesville, Pa.

NEW CAPACITY ~ NEW QUALITY

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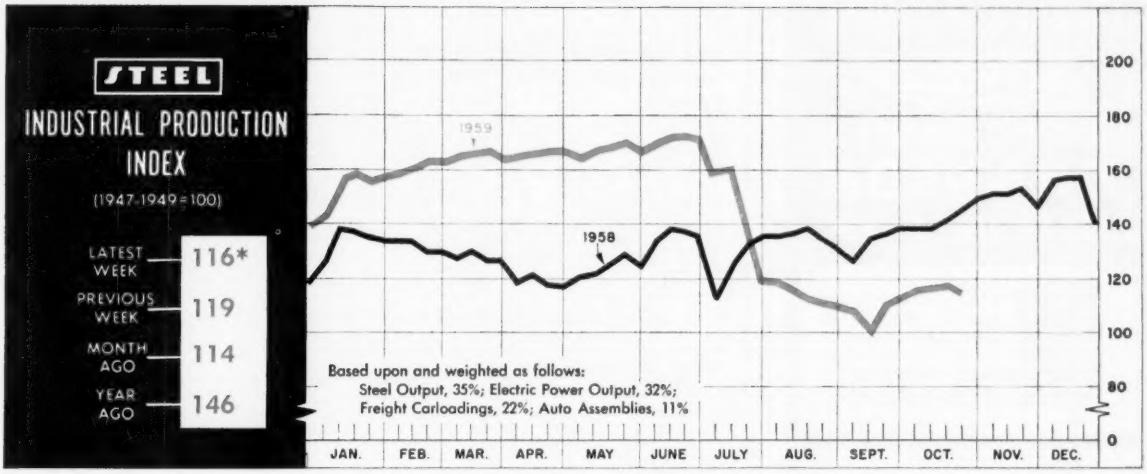
SERVING INDUSTRY WITH A WIDE RANGE OF SPECIALTY CARBON, ALLOY, ARMOR AND CLAD STEEL PLATE • HEADS • PLATE SHAPES • PLATE-MATE WELDING ELECTRODES AND WIRE



*Week ended Oct. 24.

Renewed Boom to Last Through '60

AT LEAST one good thing will come from the steel strike: The economy is sure to follow a boom trend throughout 1960.

Up to the first of October, there was some doubt about the second half of next year. If the strike had been settled then, the economy might have made a substantial start on its climb to new highs this year. But it is almost a certainty now that the rise will not come earlier than December, maybe not until the first quarter of 1960. By then, the whole business cycle will be out of kilter by approximately a half year, which in the long run may be an advantage.

Quarter by quarter, here is how things could shape up:

• **Rest of '59**—In the third quarter, the gross national product declined to about $481 billion (annual rate, seasonally adjusted), well under the third quarter's $484.5 billion. Even if steelmakers were to get in six full weeks at peak operations this quarter, it doesn't seem likely that GNP will rise much above $490 billion because of the cutbacks now taking place in practically all segments of metalworking. Services and nondurable goods industries can be expected to hold their own or expand slightly, and Christmas sales are still expected to top 1958's level, but the advances will not be enough.

• **First Quarter** — Assuming that steel mills will be getting back to normal by the first of the year, the January-March quarter will be a humdinger. Steelmakers will push for near capacity operations. It can be assumed that the aluminum and copper industries will follow the steel settlement, setting the stage for complete recovery in the entire primary metals field.

Fabricators should be getting back on their feet during that period, and consumer confidence, which has remained strong throughout the crisis, will be stimulated by higher wages and renewed availability of goods, especially cars. Manufactur-

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1,000 net tons)[2]	382[1]	371	2,024
Electric Power Distributed (million kw-hr)	12,900[1]	12,861	12,175
Bituminous Coal Output (1,000 tons)	7,875[1]	7,715	8,700
Crude Oil Production (daily avg—1,000 bbl)	6,825[1]	6,839	6,919
Construction Volume (*ENR*—millions)	$261.0	$264.3	$251.4
Auto, Truck Output, U. S., Canada (*Ward's*)	139,409[1]	162,704	90,410
TRADE			
Freight Carloadings (1,000 Cars)	575[1]	581	674
Business Failures (Dun & Bradstreet)	252	274	288
Currency in Circulation (millions)[3]	$32,026	$32,096	$31,435
Dept. Store Sales (changes from year ago)[3]	+10%	+3%	+6%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$28,036	$20,939	$24,399
Federal Gross Debt (billions)	$289.9	$287.7	$280.5
Bond Volume, NYSE (millions)	$26 191	$25,323	$26,082
Stocks Sales, NYSE (thousands of shares)	13,887	11,543	19,464
Loans and Investments (billions)[4]	$104.1	$104.2	$94.6
U. S. Govt. Obligations Held (billions)[4]	$27.5	$27.7	$32.1
PRICES			
STEEL's Finished Steel Price Index[5]	247.82	247.82	246.65
STEEL's Nonferrous Metal Price Index[6]	226.5	224.8	215.5
All Commodities[7]	119.1	119.2	118.6
Commodities Other than Farm & Foods[7]	128.5	128.5	126.1

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1959, 2,831,486; 1958, 2,699,173. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

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Ultrasonic Cleaners by
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Bulletin S-233A

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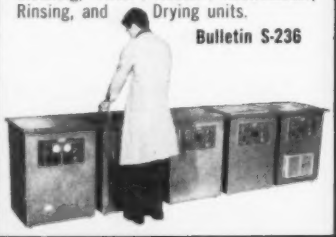

Custom-engineered cleaning installations: for batch and conveyorized cleaning, and for continuous-flow cleaning in strip and wire mills.
Bulletin S-235

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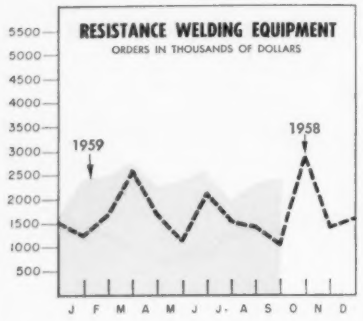
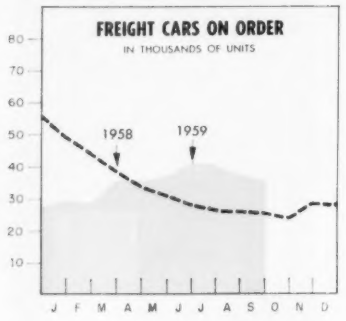
THE BUSINESS TREND





	Net Orders 1959	Net Orders 1958	Shipment 1959	Shipment 1958
Jan.	2,396	1,243	1,427	1,422
Feb.	2,457	1,683	1,889	1,615
Mar.	2,811	2,550	2,179	1,659
Apr.	2,258	1,684	2,193	1,963
May	2,407	1,121	2,019	1,750
June	2,597	2,113	2,702	2,346
July	1,980	1,534	2,269	2,342
Aug.	2,322	1,431	2,928	1,419
Sept.	2,435	1,060	2,113	1,125
Oct.	....	2,885	....	1,559
Nov.	....	1,409	....	1,102
Dec.	....	1,554	....	1,357
Totals	....	20,258	....	19,659

Resistance Welder Manufacturers' Assn.
Charts copyright, 1959, STEEL.

	Awards 1959	Awards 1958	Backlogs (end of month) 1959	Backlogs (end of month) 1958
Jan.	4,007	401	29,470	48,787
Feb.	1,806	287	28,789	43,750
Mar.	10,795	193	35,487	38,027
Apr.	3,736	278	35,479	32,908
May	5,253	1,372	36,869	30,386
June	8,054	317	40,973	27,757
July	4,159	376	40,309	25,994
Aug.	1,753	1,773	37,172	25,611
Sept.	945	1,580	35,626	24,982
Oct.	....	781	.....	23,670
Nov.	....	6,295	.....	27,962
Dec.	....	3,830	.....	27,596
Total	....	17,481		

American Railway Car Institute.

ers' orders should pick up again. Gross national product will finally break through the $500 billion barrier in this quarter.

• **Second Quarter** — The rise will continue unabated through midyear. Purchasing agents tell STEEL they will still be building stocks up to eight months after the steel and copper settlements (see Page 111). The spring sales push will be more vigorous than usual in most consumer durables. Many construction projects delayed by the strike and winter weather will be resumed. Gross national product will rise, and the Federal Reserve Board's industrial production index will reach record heights.

• **Third Quarter**—As usual, a seasonal slowdown will start after July 4, but next year it should be less than usual. Vacations will be staggered to maintain production schedules at slightly reduced levels. Seasonally adjusted, it means that the uptrend will continue through this quarter.

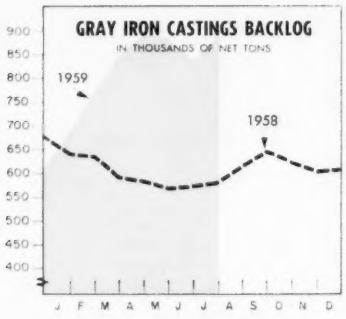
• **Fourth Quarter**—By September, stocks should be pretty well in balance at levels sufficient to maintain high level production. Inventory buying of raw materials will slacken, and a leveling off effect will start to show up. However, consumption of metals will remain at record levels.

Holiday activity in sales and manufacturing next year will be at all-time highs because of the prosperity which will precede it. New model auto introduction in 1960 will probably not be as active as this year's because of the lack of important model changes, but it will still start the fourth quarter off strong. While the over-all business activity may not show as much improvement over the third quarter as it has in some years, it will still be enough to produce more records in both GNP and the FRB index.

• **In Toto**—Toting up the scorecard, it looks like 1960 will average $510 billion or better for gross national product and 160 or better (1947-49 = 100) for the FRB industrial production index.

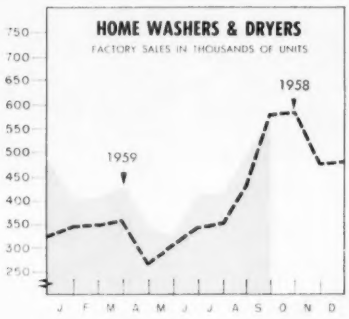
Dip Not Likely Until 1961

If there is to be a recession following this boom, it will probably start in the first quarter of 1961. Unless backlogs build up significantly within the next year, it could be sharper



	Shipments		Unfilled Orders*	
	1959	1958	1959	1958*
Jan.	1,002	868	687	638
Feb.	1,037	753	767	632
Mar.	1,206	796	847	590
Apr.	1,246	807	892	582
May	1,236	820	885	570
June	1,252	868	837	573
July	943	792	898	580
Aug.	....	802	...	614
Sept.	....	917	...	645
Oct.	....	993	...	620
Nov.	....	958	...	602
Dec.	....	998	...	608
Total	....	10,372		

*For sale. U. S. Bureau of the Census.



	Washers		Dryers	
	1959	1958	1959	1958
Jan.	288,491	244,840	118,220	100,793
Feb.	297,826	268,143	106,274	79,683
Mar.	329,668	287,884	98,434	71,523
Apr.	274,372	224,896	67,752	38,475
May	277,934	262,999	45,903	41,898
June	341,894	288,831	70,838	54,173
July	318,063	277,287	95,248	75,513
Aug.	359,849	326,785	133,197	109,833
Sept.	394,112	423,073	174,560	158,733
Oct.	.....	404,056	.....	180,405
Nov.	.....	333,035	.....	142,499
Dec.	.....	330,520	.....	148,670
Totals	.....	3,672,349	.....	1,202,198

American Home Laundry Mfrs. Assn.

and shorter than the last recession.

However, there is some feeling that there may not be any recession of the 1957-58 type now that the cycle has been delayed. Reason: Family formations will begin to boom early in the '60s, creating more purchasing units, which means more demand for goods. This could trigger even greater expansion in production capacity during the next two years than we now anticipate and could minimize, if not eliminate, a serious recession. If we go into 1960 under those circumstances, we'll have an incredible boom year . . . The outlook is bright for steel, autos, soft goods, textiles, industrial chemicals, paper, and many other key industries," Mr. Greenspan claims.

But he warns that for 1961: "A financial business decline is in prospect for the first time in many years. There's almost sure to be an unwinding of the imbalances in capital assets. The 1961 recession may take us to the lowest postwar levels."

Greenspan Warns of Recession

Alan Greenspan, head of Townsend-Greenspan & Co. Inc., New York, declares that unless the steelworkers get steel moving quickly the boom prospects for 1960 could be aborted. The strike has created "uncertainty in the people," and the time is rapidly approaching for them to take action of some sort, especially regarding stock holdings.

He reasons: If the stock market strengthens, investors' portfolios will be imbalanced. Stockholders will buy other things and stimulate the economy.

"All we have to do is remove the source of uncertainty and we'll have a resurgence of bullish sentiment.

Strike Keeps Index Down

Because of the numerous delays in the settlement of the steel strike, STEEL's industrial production index has continued to show weakness rather than the strength expected a week or so ago. The biggest factor in the 3 point decline to a preliminary 116 (1947-49 = 100) during the week ended Oct. 24 was the cutback in Chevrolet new model production. Combined with other less serious strike induced slowdowns and various production problems in motordom, auto and truck production declined nearly 16 per cent from the preceding week. Further cutbacks will be made until well after the steelworkers get the mills going.

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→ 0/8

BUT HOW EXACT!

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1. Accu-Ray nuclear gauging to assure absolute uniformity of thickness throughout.

2. Unique rolling mill for strip from .001" down, makes possible extremely close control of the final preanneal temper, and uniform accuracy of the final temper.

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3. Experience exclusively with thin strip metals gives Somers an unmatched background in engineering *ultra-thin* strip to meet all special requirements.

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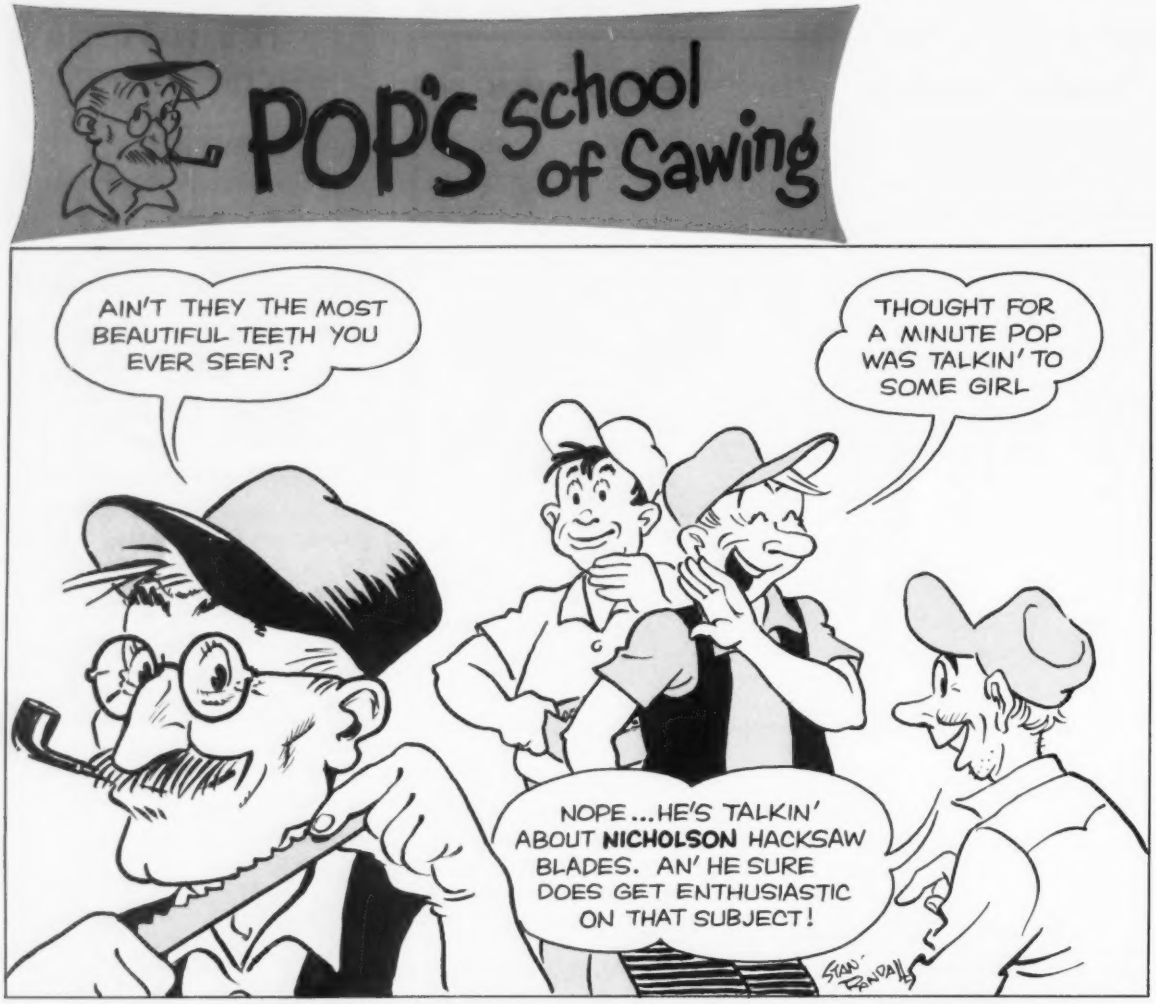
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AIN'T THEY THE MOST BEAUTIFUL TEETH YOU EVER SEEN?
THOUGHT FOR A MINUTE POP WAS TALKIN' TO SOME GIRL
NOPE...HE'S TALKIN' ABOUT NICHOLSON HACKSAW BLADES. AN' HE SURE DOES GET ENTHUSIASTIC ON THAT SUBJECT!
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14" x 1¼" x .062-6T
Welded Edge Shatterproof

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High Speed Steel	Standard Steel
Flexible High Speed Molybdenum	All Hard Standard
All Hard Molybdenum	Special Shatterproof
All Hard Tungsten	Flexible Standard

POWER HACKSAW BLADES

Welded Edge Shatterproof	All Hard Molybdenum
Flexible High Speed Molybdenum Steel	All Hard Tungsten—18-4-1

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Files • Rotary Burs • Hacksaw and Band Saw Blades
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ROBERT T. HOOD
heads Gabriel division

WILLIAM N. MATHESON
Oliver Iron Mining exec. v. p.

JOHN S. BUGAS
Ford foreign operations

RICHARD B. STEINMETZ
Anaconda Wire & Cable pres.

Robert T. Hood was appointed president and general manager, Gabriel Div., **Gabriel Co.**, Cleveland. He continues as corporate vice president and treasurer, a post he has held since May, 1958.

William N. Matheson was made executive vice president, **Oliver Iron Mining Div.**, Duluth, U. S. Steel Corp. He was vice president-operations.

F. I. Walsh fills the new post of vice president and general manager, **Dexter Co.**, a division of Miehle-Goss-Dexter Inc. He has headquarters at the Dexter plant in Pearl River, N. Y.

Dr. John G. Frayne was made manager of development engineering at **Datalab Div.**, Consolidated Electrodynamics Corp., Pasadena, Calif. He was engineering manager of Westrex Corp.

John E. Storm was made sales manager, **Frauenthal Div.**, Kaydon Engineering Corp., Muskegon, Mich. He was vice president-sales, Van Norman Machine Co., a division of Van Norman Industries.

Electric Autolite Co.'s General Products Group appointed **J. M. Gerber** operations manager for the Hazelton, Pa., facilities. He is succeeded as western regional manager, Los Angeles, by **D. M. Skirving**, who is replaced as eastern regional sales manager, New York, by **Virgil R. Steinmeyer**, previously Chicago district manager. Regional manager for the midcentral region is **K. L. Gackel.**

John S. Bugas, vice president-international group and vice president-industrial relations, **Ford Motor Co.**, Dearborn, Mich., relinquishes his industrial relations responsibilities to devote full time to Ford's foreign affiliates. **Kenneth D. Cassidy** was named vice president-industrial relations, succeeding Mr. Bugas. **Malcolm L. Denise** was named vice president-labor relations, reporting to Mr. Cassidy.

Richard J. Keates was made manager - manufacturing engineering, Phenolic Products Section, Chemical Materials Dept., **General Electric Co.**, Pittsfield, Mass.

Salem-Brosius Inc., Pittsburgh, appointed **E. L. Talley Jr.** sales manager, mechanical products. He was administrative assistant to vice president-sales.

Eric G. Boehm was made general manager, Manzel Div., Buffalo, **Houdaille Industries Inc.**

John M. Brion was made general sales manager, **Eastern Rolling Mills Inc.**, New York. He was a vice president of Peter A. Frasse & Co. Inc.

Charles R. Hook resigns as chairman of **Armco Steel Corp.**, Middletown, Ohio, ending 57 years of service with the company. He was elected honorary chairman and continues as a director. Starting in 1902 as night superintendent of Armco's first plant in Middletown, Mr. Hook became president in 1930 and chairman in 1948.

Richard B. Steinmetz was elected president, **Anaconda Wire & Cable Co.**, New York, subsidiary of Anaconda Co. Formerly executive vice president, he succeeds **William E. Sprackling**, retired.

Robert L. Space was made sales manager, **Branford Machine & Mfg. Co.**, North Haven, Conn. He was sales manager, Smith & Winchester Mfg. Co.

E. C. Nicholides was made manager of manufacturing, **Daystrom-Weston Industrial Div.**, Daystrom Inc., Poughkeepsie, N. Y.

Leonard N. McCutcheon was made Boston district sales manager, **Wheeling Steel Corp.**

Ralph D. Mount was made general sales manager, **Bassick Co.**, Bridgeport, Conn., a division of Stewart-Warner Corp.

Howard Voight was elected president, **Stedman Foundry & Machine Co.**, Aurora, Ind., a subsidiary of United Engineering & Foundry Co.

Theodore Van Zelst was elected a vice president of **Cenco Instruments Corp.**, Chicago. He is president of Soiltest Inc., which was acquired by Cenco in June.

Charles S. Estabrook Jr. was appointed manager of purchasing, **Lamson Corp.**, Syracuse, N. Y. He is assisted by **William Carr.**

Richard C. Palmer was appointed a vice president, **Stromberg-Carlson Div.**, General Dynamics Corp. He

EARLE V. SCHIRMER
Brooks & Perkins chief eng.

HOWARD C. JONES
new post-Consolidated Vacuum

THOMAS L. PARKER
Columbia Steel & Shafting pres.

W. H. DRESING
Cleveland Forge Wks. post

will manage the Washington office, succeeding **Andrew H. Bergeson.**

Earle V. Schirmer was made chief engineer, **Brooks & Perkins Inc.,** Detroit. He was chief design engineer. **J. S. Kirkpatrick,** vice president-research and development, continues to handle industry contacts on research and development and to devote additional efforts to new products and diversification planning.

Halle P. Robb was made sales manager, **Electric Steel Foundry Co.,** directing activities from San Francisco headquarters for northern California, Nevada, and Utah, and continuing as manager of Pacific area sales for the International Div. **W. R. Rice** was made sales manager, mill products.

Herbert Swanson was made chief engineer, **Market Forge Co.,** Everett, Mass. **Earl H. Barry** was made manager, Janitorial Equipment Div.

G. E. Dignan, E. K. Miller and **Dr. Gaylord W. Penney** joined the consulting staff of **S. P. Kinney Engineers Inc.,** Carnegie, Pa., for consultation on blast furnace matters and to assist in precipitator research and development. Mr. Dignan was vice president-operations, Pittsburgh Coke & Chemical Co. Mr. Miller was vice president, Jones & Laughlin Steel Corp. Dr. Penney is professor of engineering at Carnegie Institute of Technology.

Joseph Molnar was made chief industrial engineer-methods, **United States Steel Corp.,** Pittsburgh. He is succeeded as chief engineer-wage and salary evaluation by **C. C. Womack.**

Howard C. Jones was appointed assistant to the president; **Malvern J. Gross,** director of manufacturing, **Consolidated Vacuum Corp.,** Rochester, N. Y. Mr. Jones was director of manufacturing. In his newly created post, he works closely with the president on matters affecting long range planning, particularly relating to company acquisitions and new product lines. Mr. Gross was vice president-manufacturing of Tracerlab Inc. and general manager of its subsidiary, Keleket X-Ray Corp.

Edgar L. Bands was appointed superintendent of the hot strip mill of the Ashland, Ky., Works of **Armco Steel Corp.** He succeeds **W. Fred Songer,** retired.

Appointments in the sales and marketing departments of the Metals Div., **Kelsey-Hayes Co.,** New Hartford, N. Y., are: **Charles J. Bergen,** manager-sales administration; **Patrick W. Nolan,** manager - market planning; **Richard S. Spencer,** eastern sales manager.

Thomas L. Parker was named president, **Columbia Steel & Shafting Co.,** Carnegie, Pa. He succeeds his brother, **George E. Parker,** now chairman.

W. H. Dresing was appointed manager - commercial forging sales, **Cleveland Forge Works,** Forge & Fittings Div., H. K. Porter Company Inc.

Appointed chief engineers, Electrical Products Group, **Electric Autolite Co.,** Toledo, Ohio, are **John Winslow,** starting motor section; **Roy Stott,** generator section; **Harry Seubert,** distributor section.

David A. Lupfer was made general manager, Materials & Ceramics Div., **Gulton Industries Inc.,** Metuchen, N. J. **Robert Day** was named general manager, Gulton Instrumentation Div.; **Dr. Robert C. Shair,** director of research, Alkaline Battery Div.; **Harlan P. Tripp,** manager, Ceramics Coating Dept.

Richard G. Lyall was made chief

CHARLES J. BERGEN — PATRICK W. NOLAN — RICHARD S. SPENCER
Kelsey-Hayes Metals Div. appointments

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Connellsville v. p.-gen. mgr.

SCOTT H. HANVILLE JR.
Jack & Heintz sales post

EUGENE P. CUNNINGHAM
Clearing senior v. p.

HARRY M. RABER
Allis-Chalmers works mgr.

J. R. CONNELL
B&W Boiler Div. p. a.

engineer, **Morrison Steel Products Inc.**, Buffalo.

Eugene P. Cunningham was named senior vice president, **Clearing Div.**, Chicago, U. S. Industries Inc. He was vice president-sales.

Harry M. Raber was made works manager of turbines, York, Pa., Works, **Allis-Chalmers Mfg. Co.** He succeeds **Russell A. Hedden**, recently named works manager of manufacturing, Industries Group, West Allis, Wis., Works.

William G. Miller was made general sales manager, **Lucas Steel Co.**, Toledo, Ohio.

William G. Hewitt, marketing analyst for **Bunker Hill Co.**, San Francisco, was appointed assistant to the president.

Charles D. Howell was made assistant vice president-manufacturing, **Westinghouse Air Brake Co.**, Pittsburgh. He was with Ford Motor Co.

J. R. Connell was appointed purchasing agent, Boiler Div., Barberton, Ohio, **Babcock & Wilcox Co.** Former assistant general purchasing agent for the division, he became acting division purchasing agent last December.

W. Scott Fitz Jr. was made market analyst for **Kennametal Inc.**, Latrobe, Pa., and will work on marketing problems of metalworking and mining divisions. He was with Joy Mfg. Co. as manager of its Rock Bit Div.

James L. Marvin was made assistant sales manager, Kenosha, Wis., Div., **American Brass Co.** He is succeeded by **Charles C. Corzatt** as Chicago district sales manager.

Raymond C. Chenoweth was made purchasing agent, Ohio Div., **Associated Spring Corp.**, Dayton, Ohio.

Richard W. Powell was made manager of **Aerojet - General Corp.'s** Avionics Div., Azusa, Calif.

Howard J. Seel was promoted to chief engineer, **Harris-Seybold Div.**, Cleveland, Harris-Intertype Corp. He was chief engineer of the division's Cleveland plant and retains that post while assuming new responsibilities for engineering at the Dayton, Ohio, plant.

Russell L. Lepley was named vice president and general manager, **Connellsville Mfg. & Mine Supply Co.**, Connellsville, Pa. He was production manager.

Scott H. Hanville Jr. was made manager, aviation sales and application engineering, **Jack & Heintz Inc.**, Cleveland. He adds the duties of sales manager for aircraft and missile products to his duties as manager-application engineering, a post he assumed when it was created a year ago.

Maynard E. Montrose, vice president-sales, succeeds **Fred W. Ayers** as senior vice president and general manager, **Hughes Tool Co.**, Houston. Mr. Ayers fills the new post of vice chairman.

OBITUARIES...

Wendell W. Anderson, 58, president, **Bundy Tubing Co.**, Detroit, died Oct. 20.

Glenn J. Jury, chairman, **Inland Tool & Mfg. Co.**, Detroit, died Oct. 12.

Dan P. Eels, 75, retired vice president, **Bucyrus-Erie Co.**, Milwaukee, died Oct. 15.

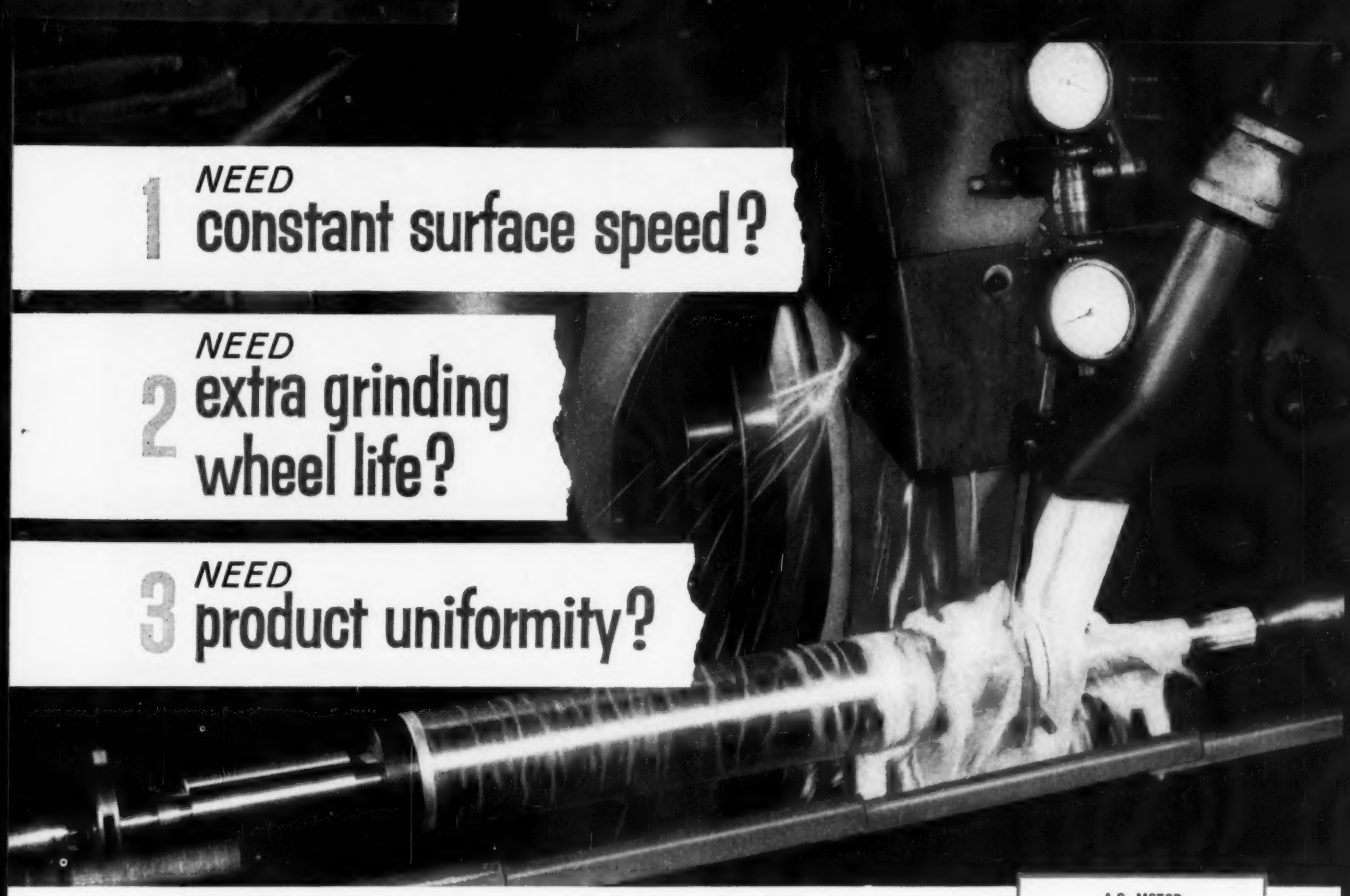
George H. Halpin, 69, vice chairman of the executive committee of **Minnesota Mining & Mfg. Co.**, Minneapolis, died Oct. 19.

John F. Brown, 79, former chief engineer, South Works, Chicago, **U. S. Steel Corp.**, died Oct. 18.

F. W. McIntyre Sr., 72, retired president, **Reed-Prentice Corp.**, Worcester, Mass., died recently.

Charles R. Harbaugh, 85, secretary, **Atlas Bolt & Screw Co.**, Cleveland, died Oct. 24.

Chester H. Lehman, 73, retired executive vice president, **Blaw-Knox Co.**, Pittsburgh, died Oct. 22.



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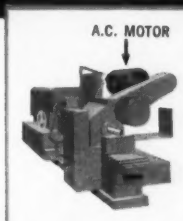

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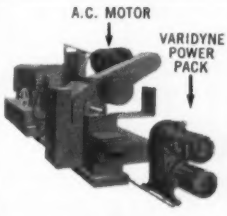

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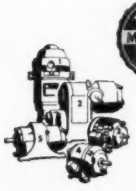

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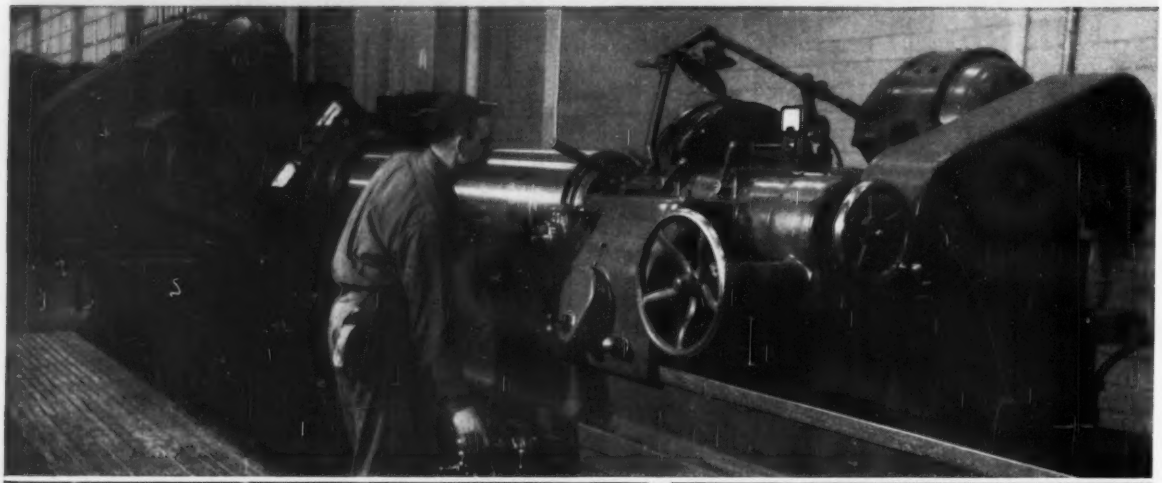

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To meet rolling mills' requirements for repeatedly good performance in roll grinding, Norton now brings you these two outstanding specialities:

NEW!

B12 Resinoid Wheels for hot mill rolls.

E6 Shellac Wheels for cold mill rolls.

The new B12 and E6 wheels are made under process controls that assure precise duplication — from wheel to wheel and from lot to lot. In both wheel types that means duplicating the same outstanding features and performance — including the precise balance and uniform structure that result in fast, smooth grinding and long wheel life.

These advantages have been reported from mills throughout the country. Extensive job-testing gave the new Norton wheels first place in economy, in production-per-wheel and in producing the desired chatter-free finishes. Both new wheels maintained top grinding efficiency from full size to discard.

Let us show you how these "Touch of Gold" benefits can bring you trouble-free grinding and cut your production costs by arranging test runs of B12 or E6 wheels in your mill. NORTON COMPANY, General Offices, Worcester 6, Mass. Plants and distributors around the world.

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Jessop Steel Broadens Distribution Facilities

JESSOP STEEL CO., Washington, Pa., has organized a nationwide warehousing division with headquarters in Chicago under the direction of A. J. Kueber. Creation of the Service Centers Div. makes possible an intensification of the company's activities beyond the specialty and alloy steel field.

The new division will operate separately from Jessop's established sales organization and distributor system which sells Jessop tool and stainless steels, armor plate, precision ground steels, stainless clad steels, and alloys. In addition to warehousing specialty steels made by Jessop and alloys produced by its subsidiary, Green River Steel Corp., Owensboro, Ky., the division will stock a wide range of general steel items.

• **Strengthens Position**—The move into general warehousing was necessary from a competitive standpoint to increase the potential of Jessop and Green River sales, says Frank R. Rackley, president. "We do not intend to disturb Jessop's relations with our established distributors," Mr. Rackley adds. "A partial vacuum in certain types and grades of steel exists in certain areas. We intend to become more competitive in those areas."

The consolidation will include service centers in Chicago, Los Angeles, Detroit, and Wallaceburg, Ont., and at the firm's main plant in Washington, Pa. On Oct. 22, the company formally opened a large warehousing facility in Broadview, Ill., a Chicago suburb.

Jessop first moved into the general warehousing field earlier this year (STEEL, Apr. 6, p. 137) when it purchased Steel Warehousing Corp., Broadview and Chicago. In September, Jessop acquired Chase Steel & Supply Co., Los Angeles, an important supplier of stainless steels to the missile, rocket, and aircraft industries on the West Coast and to the U. S. Navy shipyards at Long Beach, Calif., and Pearl Harbor, Hawaii.

Forms New Service Center

Seattle Hardware Co. has formed a new division, Seattle Steel Service, at 3844 First Ave. S., Seattle. The service center covers 68,000 sq ft and is equipped with a plate shear and friction saw. It also has burning, cutting, and loading equipment. The division carries an inventory of about 5000 tons of standard steel items.

Gabriel Integrates Units

Gabriel Co., Cleveland, has integrated its Talco Engineering Co. and Rocket Power Inc., Mesa, Ariz., into a single operating unit under the direction of C. E. Bartley. Both divisions will retain their corporate identities. Rocket Power is a producer of solid propellents and rocket systems. Talco specializes in cartridge actuated devices and pilot escape systems for supersonic aircraft.

FMC Gets Bomarc Work

Food Machinery & Chemical Corp., San Jose, Calif., will build ground support equipment for Boeing Airplane Co.'s solid fuel Bomarc missile. The new contract runs through 1960. FMC has been producing similar equipment for liquid fuel Bomarcs since 1958. The Bomarc is a supersonic, long range, interceptor designed to seek out and destroy enemy bombers and air breathing missiles.

Ford Orders Strip Mill

Ford Motor Co., Dearborn, Mich., has awarded a contract to Mesta Machine Co., Pittsburgh, for a 66 in., four stand, tandem cold mill and related equipment. The mill will be capable of cold reducing steel strip up to 61.5 in. wide, 0.070 in. to 0.187 in. thick, at a maximum speed of 3250 fpm, holding the finished product to a tolerance of 0.0003 in.

Ford also has awarded a contract to General Electric Co., Schenectady, N. Y., for complete electrical systems for the new cold mill and a five stand hot strip mill at the Rouge plant.

Forms Pangborn Canada

Pangborn Canada Ltd., 38 Mattson Rd., Toronto, Ont., has been incorporated to market the line of blast cleaning and dust control equipment and metal abrasives produced by its parent, Pangborn Corp., Hagerstown, Md. Officers of the subsidiary are: President, R. M. Trent; vice president, Lloyd L. Stouffer; secretary, H. R. Fisher; and treasurer, J. R. Bell.

Will Extrude Aluminum

Pacific Extrusions Inc., a new firm, has established an aluminum extrusion facility in Watsonville, Calif. The company is an affiliate of Aluminum Extrusions Inc., Charlotte, Mich. Officers are: President, Frank Gregg; vice presidents, C. R. Henry and W. E. Dunlap; and secretary, D. R. Bishop.

Buys St. Louis Warehouse

Nixdorff-Krein Mfg. Co., St. Louis, purchased a warehouse at Ninth and Mullanphy Streets, that city. The 26,000 sq ft structure will be used by the firm's wholly owned subsidiaries: Midwest Strongwall Co., maker of masonry block wire reinforcing, and Gared Corp., maker of athletic equipment. The parent firm makes industrial, tire, and tractor chains; wire products; and farm implements.

Chromalloy Ups Capacity

Chromalloy Corp., White Plains, N. Y., is increasing its production facilities. Its Chromalloy Div. will build an extension to its White Plains plant for increased production of Iochrome, a superpure chromium metal. The company's West Coast subsidiary, Chromizing Corp., also is installing additional large furnace equipment. A third expansion step is planned for execution during the latter part of the year. As a result of the program,

Jan. 1, 1959, capacity at the White Plains plant will be increased five-fold.

NEW ADDRESSES

Tubular Products Div., Babcock & Wilcox Co., Beaver Falls, Pa., moved its district sales office to the Shell Bldg., 1810 S. Baltimore, Tulsa 19, Okla. Leon Wohlgemuth is general sales manager for the division.

Armalite Co. Ltd. moved to its new plant at 907 Oxford St., Toronto 18, Ont. The 30,000 sq ft factory has been equipped with new machinery and an enlarged customer service laboratory. The company makes metal finishing materials and equipment.

ASSOCIATIONS

Foundry Equipment Manufacturers Association, Washington, elected these officers: President, E. A. Borch, National Metal Abrasive Co., Cleveland; first vice president, R. A. Brackett, Spencer Turbine Co., Hartford, Conn.; and second vice president, C. G. Hawley, Jeffrey Mfg. Co., Columbus, Ohio. Executive secretary and treasurer is C. R. Heller.

American Society for Metals, Novelty, Ohio, established a news bureau and appointed J. C. Nelson as its manager. Allan Ray Putnam is managing director of the society.

Lawrence Priddy Jr. has joined the executive staff of the **Western Electronic Manufacturers Association,** Los Angeles. He will be assigned to special projects.

National Industrial Advertisers Association, New York, changed its name to **Association of Industrial Advertisers.** John C. Freeman is president.

Powder Metallurgy Parts Manufacturers Association, Pittsburgh, elected these officers: President, C. J. Demrick, Amplex Div., Chrysler Corp., Detroit; vice president, Smith Bolton, U. S. Graphite Co., Saginaw, Mich.; and treasurer, G. G. Fellows, American Powdered Metals Inc., North Haven, Conn. Hanson & Shea Inc., Pittsburgh, was reappointed to direct activities of the group.

CONSOLIDATIONS

General Mills Inc., Minneapolis, acquired **Magnaflux Corp.,** Chicago, developer of nondestructive testing systems. General Mills terms the move a major step in long range plans for diversification. Officers of Magnaflux are: President, R. A. Wilson, who is vice president of General Mills and general manager of its Mechanical Div.; executive vice president, W. E. Thomas; vice president and assistant to the president, C. E. Betz; vice president-manufacturing and treasurer, W. D. Reid; vice president - marketing, R. O. Schiebel; vice president-research and engineering, Hamilton Migel; and secretary, W. C. Babcock.

Meehanite Metal Corp., New Rochelle, N. Y., has been purchased by **Harry H. Kessler & Associates,** St. Louis. Mr. Kessler will become president of Meehanite which controls patents and processes used in quality iron castings for machinery where strength, heat, ductility, and corrosion and rust resistance are major factors.

Indiana Steel Products Co., Valparaiso, Ind., and **General Ceramics Corp.,** Keasbey, N. J., have merged into Indiana General Corp. The company makes permanent magnets and ferrite magnetic materials. Officers of the new corporation will include: Chairman, P. R. Doelz; chairman of the executive committee, H. H. Arnhold; president and chief executive officer, R. F. Smith; and executive vice president, J. H. Bouwmeester.

Girdler Construction Div. of Chemetron Corp., Louisville, will combine its activities and facilities with those of **Chemical & Industrial Corp.,** Cincinnati. Girdler will become a subsidiary of the Ohio firm. Both are engaged in the design, engineering, and construction of processing plants. H. H. Hamilton will continue as chief executive officer of Chemical & Industrial Corp. while W. Roberts Wood will continue as head of Girdler.

Howell Electric Motors Co., Howell, Mich., acquired **Leland Electric Co.,** Dayton, Ohio, maker of electric motors and generators. Leland was formerly a division of American Machine & Foundry Co., New York.

NEW OFFICES

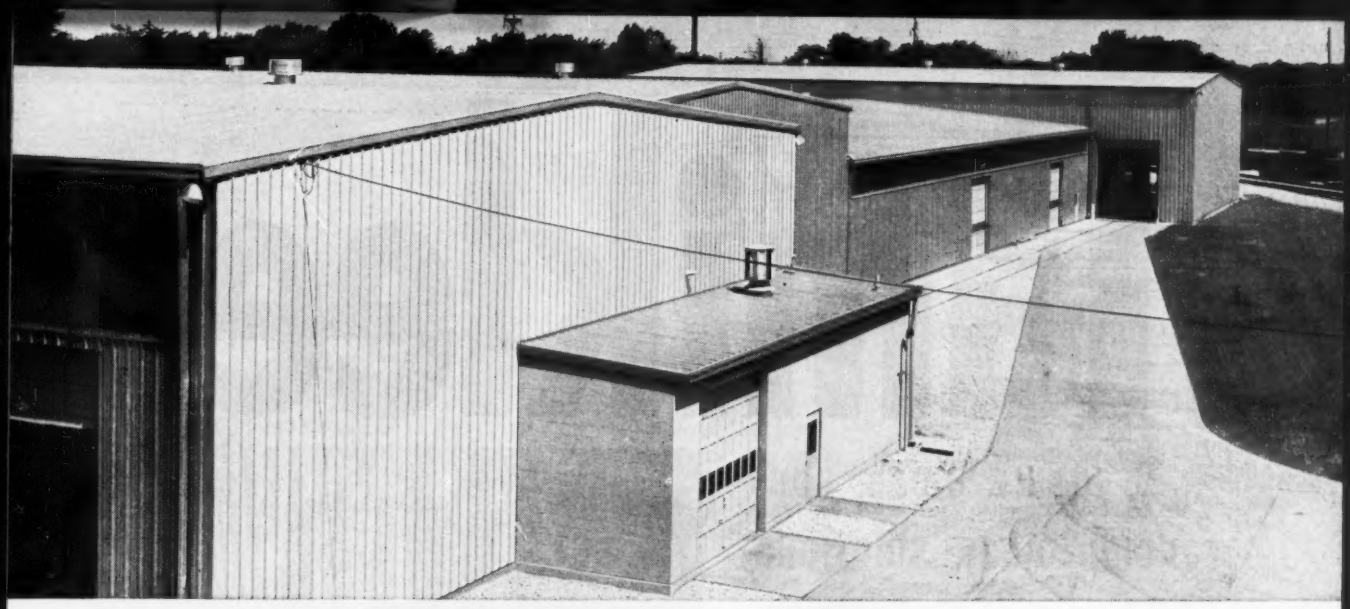
Ford Motor Co., Dearborn, Mich., is opening an office in the Boston area for advanced research and development work in space sciences, astrodynamics, and range instrumentation. The facility will be assigned to the Aeronutronic Div.'s Range Systems Operations, directed by Dr. E. H. Krause. Dr. Eric Durand, presently manager of Space Sciences & Advanced Planning at Aeronutronic's headquarters in Newport Beach, Calif., will manage the Boston facility.

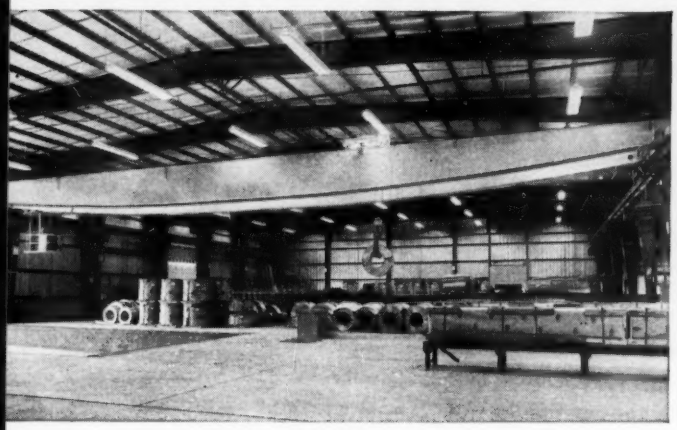
NEW PLANTS

Protection Controls Inc., maker of electrical safety equipment and controls, Chicago, completed construction of a plant at 7317 N. Lawndale Ave., Skokie, Ill. The expansion represents a threefold increase in plant area.

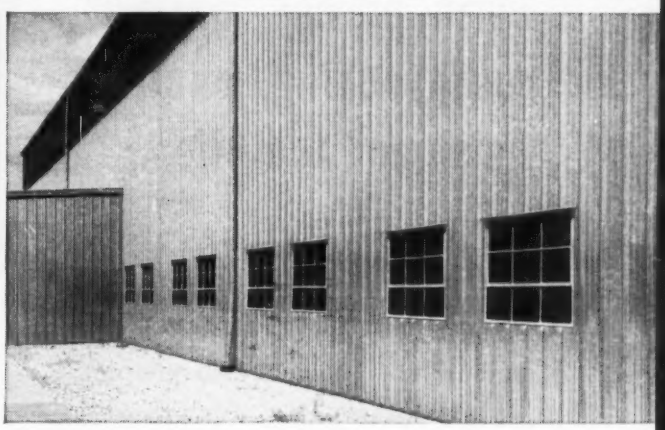
Air Reduction Sales Co., a division of Air Reduction Co. Inc., New York, is constructing a $100,000 sales office and warehouse at 2300 South Blvd., Charlotte, N. C. Occupancy is scheduled for January, 1960.

Westinghouse Electric Corp., Pittsburgh, will break ground Nov. 5 for a multimillion dollar transformer plant at Muncie, Ind. The project is the largest single capital expenditure ever undertaken by the company, says J. H. Chiles Jr., vice president of Westinghouse and manager of the Transformer Div. Prime contract for construction is held by Ebasco Services Inc., New York. The plant will contain about 600,000 sq ft of floor area.





Spacious, clear-span interiors



Beautiful new Butlerib panels

This new factory makes Butler factory buildings an even better buy

Here's one of the newest, most modern metal fabricating plants in the country. It's Butler's new factory in Galesburg, Illinois, built to produce new Butlerib™ metal cover panels for the Butler system of building. A unique combination of deep and shallow corrugations makes Butlerib panels the strongest, most rigid and most weathertight cover ever offered on Butler industrial and commercial buildings. It's a cover that's as beautiful as it is practical.

And, thanks to the streamlined efficiency of this new factory with its high-speed roll-forming equipment, Butler offers this new, superior cover as standard material on Butler buildings—at no increase in price.

This new Butler factory is also a good example of the design latitude the Butler system of building permits. Butler engineers developed the work flow pattern first. Then, with standard Butler components, they designed the building to enclose the flow pattern.

Butler Low-Profile (LRF) rigid frames form the structural system. These frames span areas up to 120 feet, yet have a low, modern 1-in-12 roof pitch. Butlerib walls and roof form a cover that gives maximum protection, yet requires only a minimum of maintenance.

If you're planning industrial construction, get the full story on the Butler system of building today. It's the pre-engineered system of building that saves you time and money, but doesn't limit plant design. And, with new Butlerib panels, it's an even better way to build . . . still the lowest-cost way to build well.

For full details, contact your Butler Builder. Ask him about Butler financing, too. He's listed in the Yellow Pages under "Buildings" or "Steel Buildings." Or write direct.

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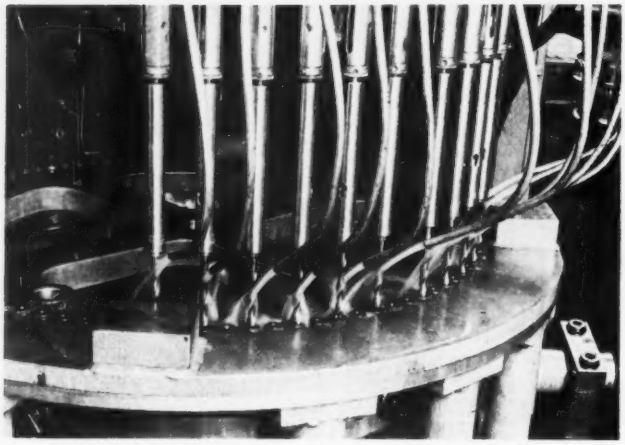
To insure clean, non-rancid, clear solutions which provide maximum rustproofing, cooling, finish and tool life



HAMIKLEER coolants are a series of odorless synthetics and rust preventives. They dissolve instantly in any water to make a clear, thin solution that can be made more dilute than is practical for ordinary soluble oils.

• HAMIKLEER odorless coolants and rust preventives were the first oil-free water soluble coolants with oily properties. These popular, cost-cutting coolants are now available as straight synthetics, synthetics with added lubricity and synthetics with added lubricity and extreme pressure qualities.

Whichever grade you use, HAMIKLEER . . .

INCREASES PRODUCTION by reducing rejects, providing finer surface finishes, always keeping the work cool, clean and visible.

INCREASES TOOL LIFE through excellent lubricity, heat-absorbing and anti-weld properties.

ELIMINATES COSTLY DISPOSAL PROBLEMS because it can be disposed of through regular outlets, if oils do not get into the mixture, and it will not pollute streams.

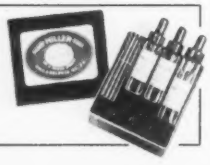
LASTS LONGER because it makes "water-thin" solutions, in any ratio of dilution, which holds to a minimum the amount carried away. It outlasts soluble oil emulsions by five times.

WILL NOT TURN RANCID so operators are not bothered by foul odors. In addition, HAMIKLEER will not affect workers' hands.

PREVENTS RUST even in hot, humid weather—and it eliminates costly cleaning operations.

As you can see, a HAMIKLEER *synthetic coolant has much to offer. Write us today for a free sample to test on your own metalworking operations.*

This free test kit is sent to all HAMIKLEER users. It permits operators to test dilution right at the machine, *saving considerable time.*



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Technical Outlook

November 2, 1959

ADHESIVE BARRIERS—Engineers at North American Aviation Corp.'s Los Angeles Div. think they can make an aircraft structure that's 50 per cent bonded. What they need: An adhesive that will survive 550° F for 2000 hours. The technique would drastically reduce brazing requirements. The engineers say that they are within about 50° F of that barrier. Ceramic-type adhesives, now being sought, may fill the bill.

COLOR ADDED TO WIRE—Wire precoated in such colors as red, blue, and gold can be formed into paper clips, spiral bindings, and comparable products without damage to the enamel coating, claims Appalachian Steel Corp., Lyndhurst, N. J. It's another example of progress in precoated finishes.

CONTINUOUS COMPACTING—A new process which uses a standard press with a cone-shaped ram forms metal powders into continuous compacts which are sintered into shaped bars. Westinghouse Electric Corp. claims the bars can be made in any length and in a wide variety of cross sections.

TRENDS IN FINISHES—The gap between the baking temperatures of paint (up to 500° F) and those for low temperature porcelain enamels (900° F and up) is gradually being narrowed, observes an industry expert. Prediction: Eventually, you'll be able to select a finish which can be baked at any temperature you desire—one which will fit the properties of the basis material being used.

EXTRUSION FRONTIERS—Beryllium ductility seems to be improved by extruding, says Lyle Christensen, Northrop Corp., Hawthorne, Calif. Conventional bend tests show extruded sections are four to six times as ductile as sheets. He thinks that severe extrusion of beryllium (and steel) into extremely thin sections is practical now—20 ft sections are practical too (STEEL, Oct. 12, p. 130). Possible answers: Improved billet handling techniques, or salt baths instead of gas-fired furnaces. Beryllium is extruded at 1750 to 1950° F; modified Stellite dies are heated to 900° F.

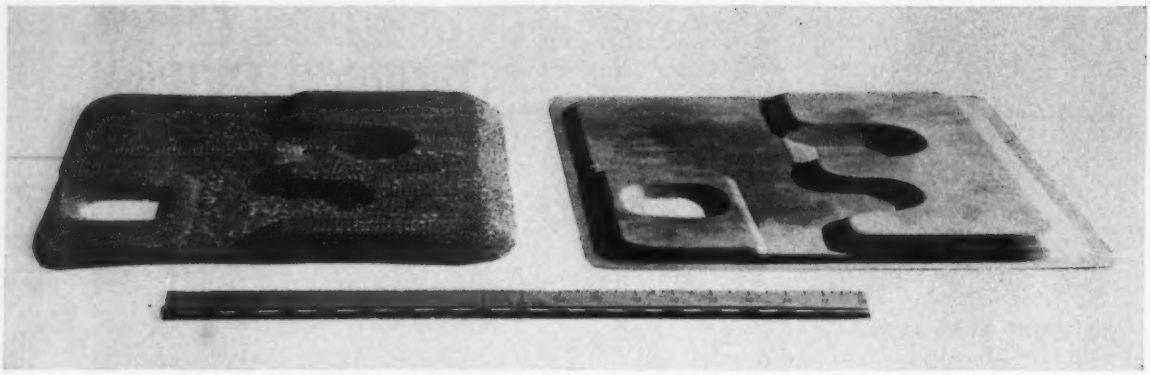
JOINT RESEARCH EFFORT— Westinghouse Electric Corp., Pittsburgh, and the NRC Equipment Corp., Newton, Mass., have agreed to jointly develop practical levitation melting equipment. The move is aimed to take advantage of the high purity and high temperature features of this laboratory technique.

STATUS REPORT ON A-PLANES— Work on atomic powerplants is being continued by General Electric Co., Schenectady, N. Y., and the Pratt & Whitney Div., United Aircraft Corp., East Hartford, Conn. The Atomic Energy Commission says two systems are being tried in an attempt to develop a long life military engine. The AEC is spending $150 million a year on the project.

MORE DUCTILE TUNGSTEN— Conventional steel mill equipment and techniques can handle the newest ductile forms of tungsten and tantalum alloys, claims the producer, Stauffer-Temescal Co., an affiliate of Stauffer Chemical Co., New York. It is working with Aerojet-General Corp., Azusa, Calif., to find rocket and missile applications for the alloys.

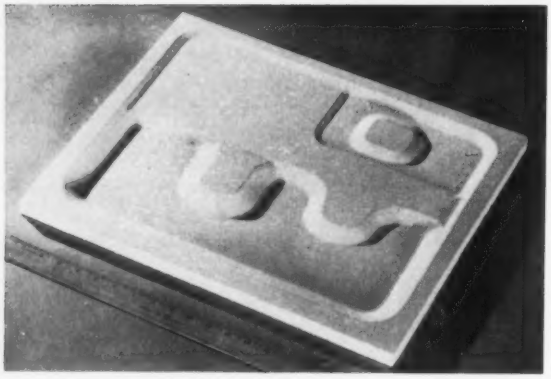
IMPROVED DIE LUBRICANT—Several auto firms report they're getting especially good results with a lubricant containing finely separated molybdenum. Mixed with a synthetic sperm lubricity agent, it is packaged in spray cans. Penetration and holding power are said to be good enough to permit easy removal of tight die inserts. Drilling and reannealing of die blocks are not necessary. Maker: Chemical Lubricants Co., Royal Oak, Mich.

Metalworking Outlook—Page 29 *Market Outlook—Page 109*

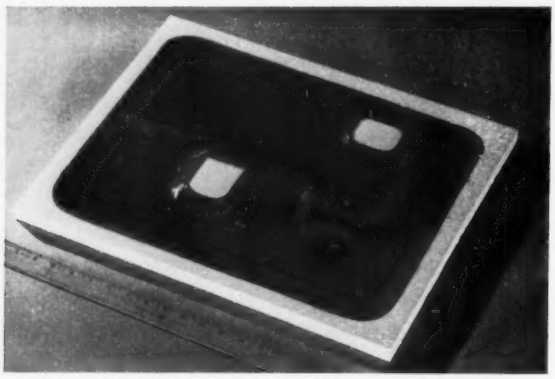


THE PROBLEM: Contour the intricately shaped honeycomb core (as at left) to fit inside the stamped panel at right. The photo sequence shows how it can be done

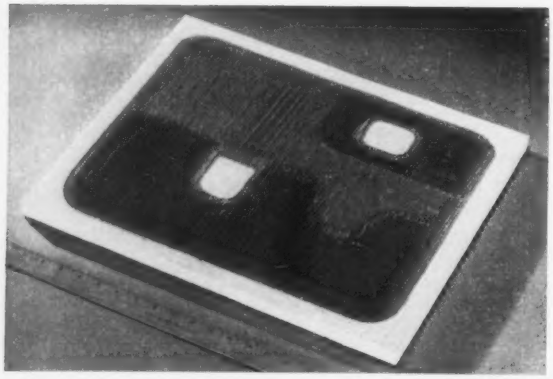
Chemicals Contour Honeycombs



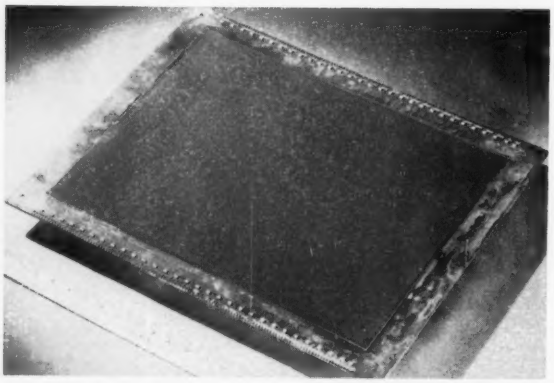
1 This soft plaster form is cast from a hard, molding plaster positive



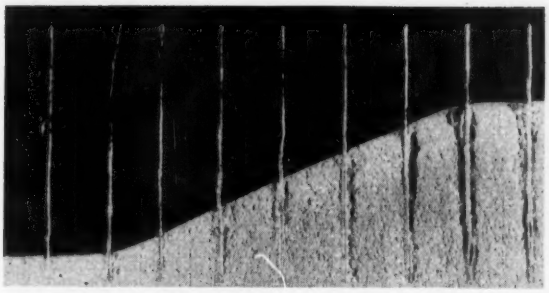
2 A Chem-Milling maskant is brushed on the soft form, about 1/16 in. thick



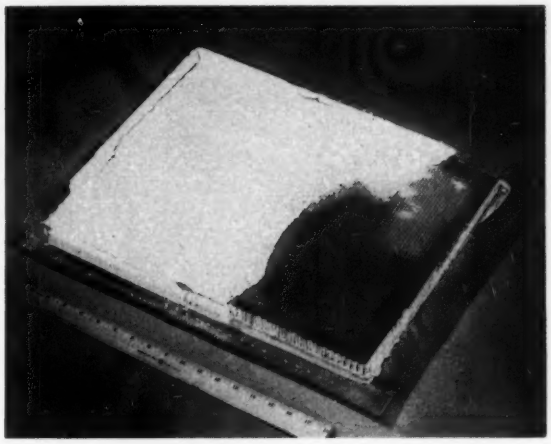
3 On a press, the honeycomb core is forced to penetrate the mask and plaster



4 A rubberlike hot melt material is poured on to support the mask layer



5 Cross section shows the core walls (vertical strips), the white soft plaster, the dark, hot melt material, and the thin mask layer



6 The water-soluble soft plaster is washed away (partially complete here) leaving exposed the core that's to be etched off

AIRCRAFT production men are taking a close look at the chemical contouring method for honeycombs just announced by the Northrop Corp.'s Norair Div., Hawthorne, Calif.

They think it may be an economical solution to one of their roughest production jobs—the contouring of honeycomb cores. Some industry spokesmen told STEEL that the process may make sculptured honeycombs practical for nonaircraft products.

• **Advantages**—A chemical etchant does the three dimensional contouring. It means that the costly, tedious job of machining the delicate core walls is bypassed. The shortcut may allow aircraft and missile designers wider latitude in the use of honeycombs.

Some shapes, like inside double curvatures, have not been feasible to produce by machining or by core crushing. Now they are as easy to generate as simpler configurations.

• **Savings**—Engineers at Norair have run cost studies, comparing the chemical process with conventional methods (machining and crushing). The part studied: A piece of core used in a landing gear strut door for the T-38 Talon supersonic trainer.

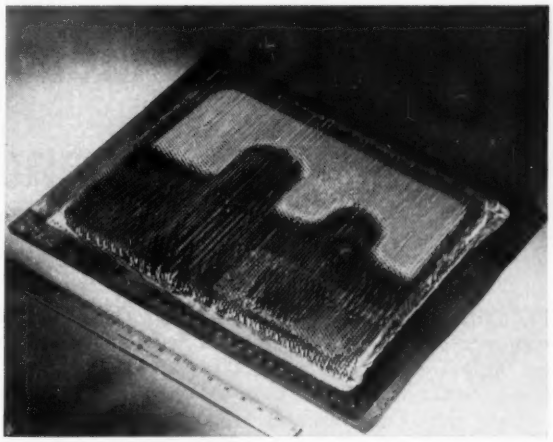
If the lot size is five, conventional methods cost $619 per piece vs. only $285 for chemical milling. If 50 parts are in the lot, chemical milling still has the edge, $88 vs. $120 per part.

Other advantages cited: No burrs or feather edges are produced, and the remaining core walls are undisturbed.

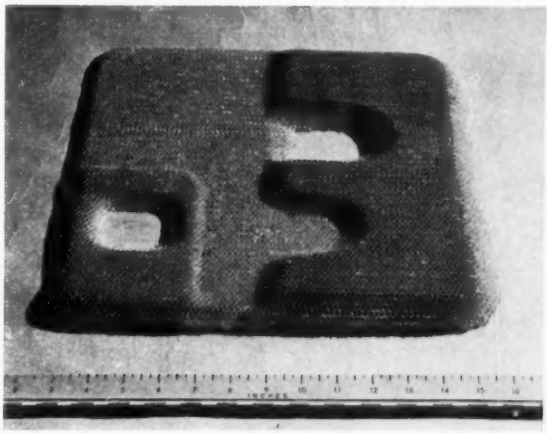
The process has proved itself on aluminum alloy Types 5052 and 3002 and on PH 15-7 Mo and 17-7 PH steels. Tolerances can be held to ±0.003 in. on aluminum and ±0.002 in. on steel.

The process was invented by Eldon Bowman, a research assistant at Norair's materials research laboratories. It's now being refined and adapted for production use by the Chem-Mill Div., Turco Products Inc., Wilmington, Calif.

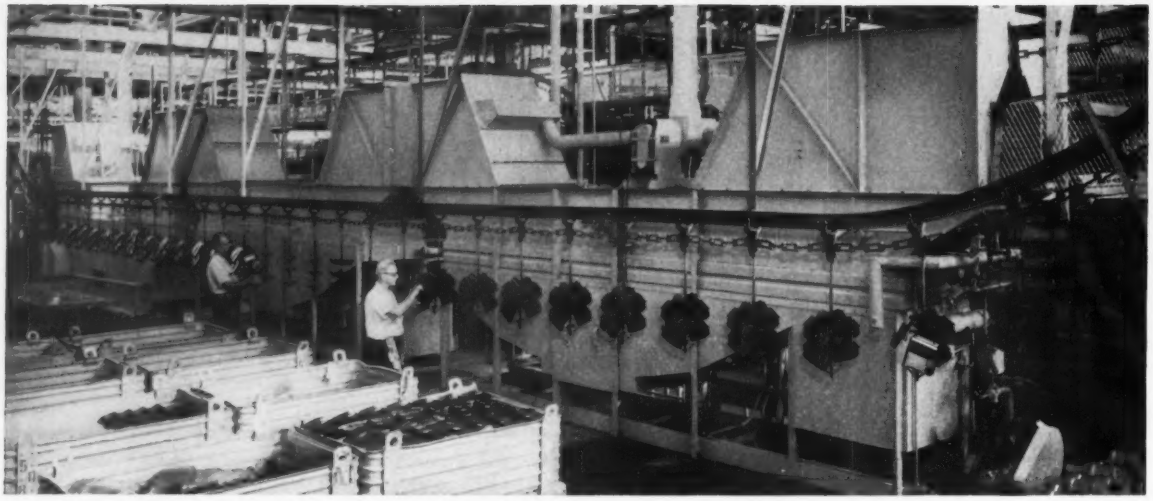
Mr. Bowman told STEEL that he fully expects to be able to contour both sides of the core at the same time—although he can't do it now. The result: A further cut in the cost of core machining.



7 With chemical etching partly done, the core is flush with the white area at top



8 The hot melt material is hand stripped; the mask is blown out of the cells by an air gun. Then the core is complete



Racks of Chevrolet engine parts move through degreasing, phosphatizing unit, and painting in about half the time required by the former method. Parts are dry when they emerge

Now You Can Clean, Phosphatize, and Paint in a Degreaser

PEOPLE AT the metal show are getting a first look at phosphatizing in a trichlorethylene solution. It may well be one of the most significant recent advances in metal finishing, experts believe, for it means you can now clean, treat, and paint metal in one unit without removing it from a conveyor.

The process does the job without water and is touted as being capable of chopping an average 40 per cent from investment and operating costs.

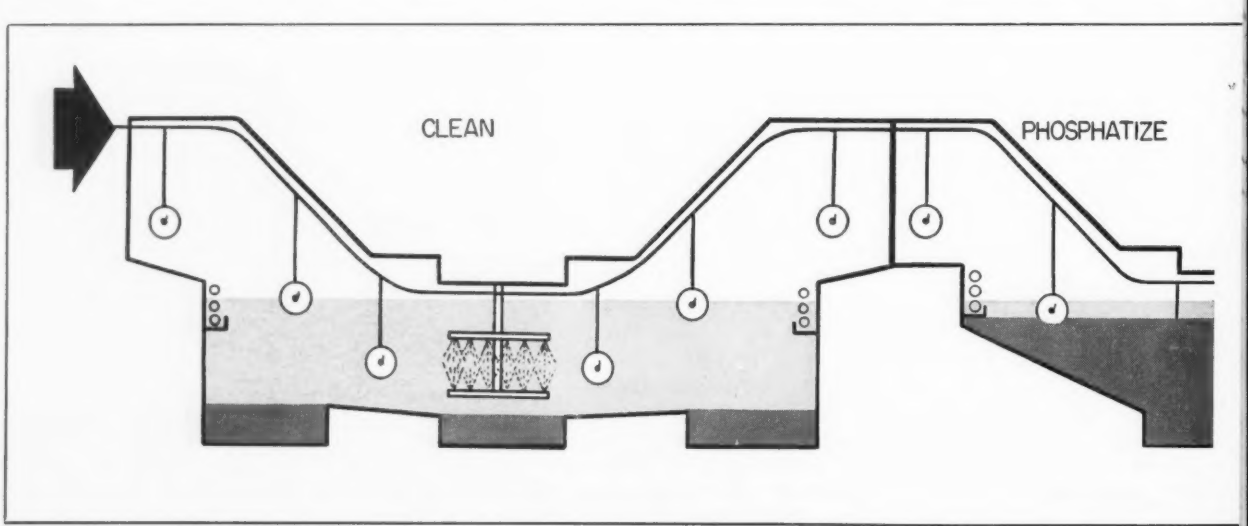
Highlights of the Du Pont proces include:

1. The method requires only one dip compared with as many as seven in aqueous systems.

2. The system works well on steel and can be applied to aluminum and zinc diecastings and galvanized coatings.

3. The equipment takes up less floor space than most conventional installations.

4. You get maximum economy



Du Pont's system is based on trichlorethylene and is said to improve paint adherence. Designed to compete with water-based systems, it offers some economies

when it is part of an in-line finishing system featuring trichlor-thinned paints. Combined with vapor degreasing, only a negligible amount of additional solvent is used.

5. A drying operation is not needed.

6. Rust resistance of unpainted steel phosphatized the new way is said to be many times that of conventional types.

• The conversion coating is produced by putting metal into contact with trichlorethylene (Triclene) and a new combination of phosphatizing chemicals.

The solution reacts with a clean steel surface, converting it mostly to strongly adherent iron phosphate, an excellent base for paint finishes. Reaction rates are fairly rapid. Coating thicknesses which weigh 40 to 200 milligrams per square foot are produced in 30 seconds to 3 minutes.

Steam or utility costs are comparatively modest and represent one of the major savings—the costs are as much as 80 per cent below those of conventional water-based systems, Du Pont claims.

• The first installation, a small dip unit in the plant of an electrical equipment maker, has been in operation nine months.

The second unit is in a Tonawanda, N. Y., plant of Chevrolet Div., General Motors Corp. It is a large conveyorized system, the first of a style being proposed by Du Pont.

Success in those fields led Du Pont to expand its development program. Such systems should be available generally by mid-1960, the firm says.

Du Pont marketing people expect future applications will include substrate coatings on tubing and sheet metal blanks for deep drawing. Phosphate coatings on steel and other metals provide ideal conditions for lubricants during severe draws.

• Equipment generally is similar to regular degreasers.

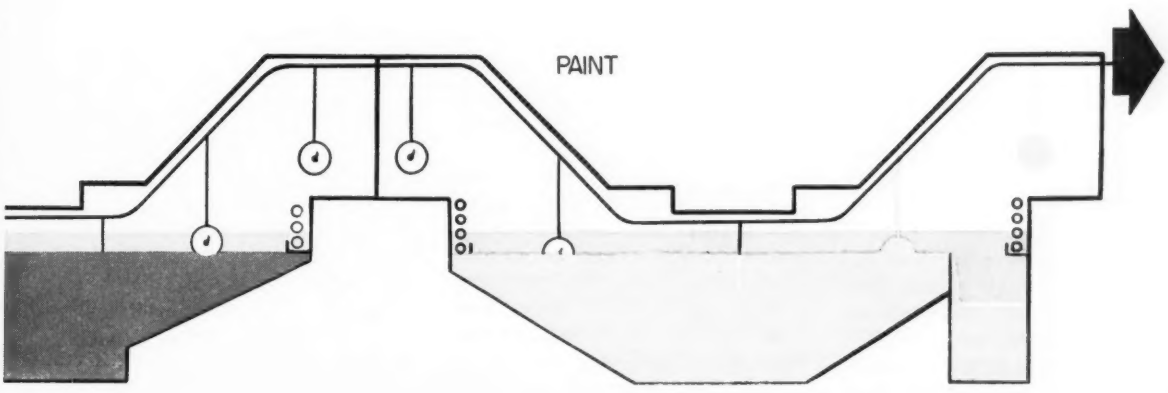
Stainless steel protects sections in contact with the phosphatizing solution. Controls are said to be comparatively simple. Ordinary checks of specific gravity and single end-point titrations suffice for the chemical function.

Du Pont started the work in 1953 at Niagara Falls, N. Y. It was completed at Chestnut Run Laboratories, near Wilmington, Del.

Du Pont Cost Comparison

	Hourly Operating Costs	
	Aqueous	Triclene
Chemicals and solvent	$1.89	$3.01
Utilities	3.96	0.68
Other operating costs (including labor, maintenance, taxes)	2.45	2.32
Operating Costs	8.30	6.01
Investment carrying cost	3.68	2.28
Total, all costs	$11.98	$8.29

Du Pont's study is based on treatment of 480 steel cabinet shelves per hour, two shifts per day. The 18 gage shelves measure 15 in. by 42 in. Aqueous system is typical five-stage type, including dry-off. Cost per 1000 sq ft is $1.97 for the new system vs. $2.85 for the old.



Close-up of a cut shows part held in heating fixture. The 1½ in. diameter, four flute solid carbide cutter is turning at 1020 rpm. Feed is 12 in. a minute. Cut depths are 0.060 to 0.200 in. The part is at 800° F

Hot Machining Gets Trial

Verdict: It works on some jobs, concludes North American Aviation. Engineers and production men tested the machinability of thermal resistant steel alloys heated up to 1000° F

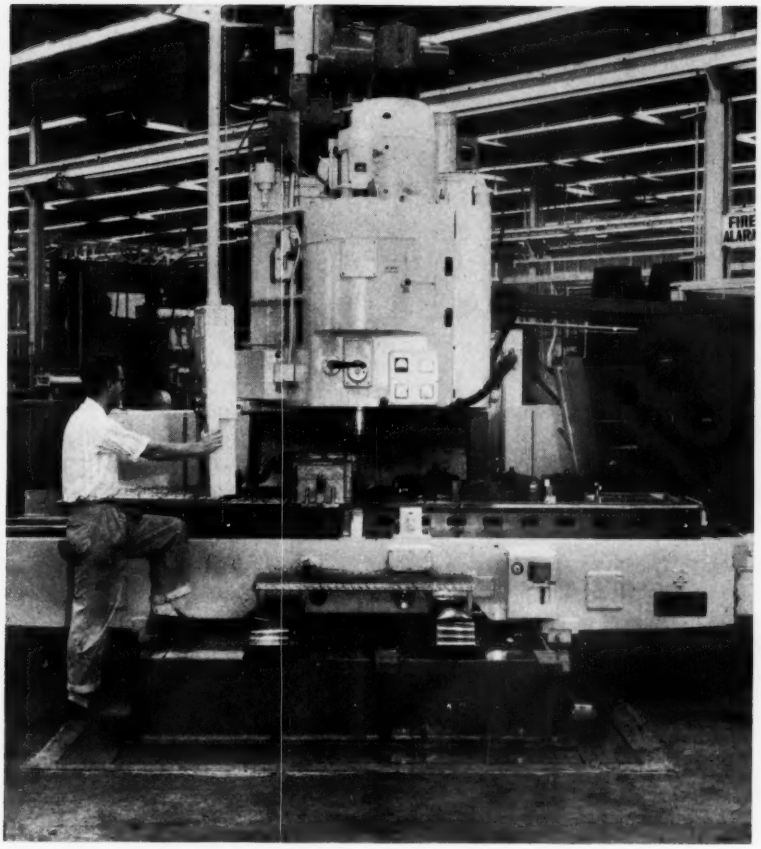
TESTS with a specially rigged milling machine show that machining at elevated temperatures can boost metal removal as much as eight times higher than conventional room temperature rates.

The approach takes advantage of the fact that most metals lose strength at higher temperatures. Production men may use it to whip some of their most treacherous cutting jobs. Two machinability projects at Los Angeles Div., North American Aviation Inc., Los Angeles, lead to that conclusion. One series of tests (sponsored by the Manufacturing Methods Branch, Air Materiel Command) was under the supervision of the division's design producibility engineers. Their report was completed several months ago. Subsequently, the heavy machining production department tried the hot machining concept under shop conditions.

Richard Bucheister, general foreman of the heavy machining department, tells STEEL he feels hot machining will be used in milling of AM 355 where the cut is relatively narrow. He adds that the method offers no significant advantage on some of the thermal resistant alloy, like Rene 41. Reason: The metals retain most of their strength at, any of the practical temperature ranges.

• **Materials**—In the North American tests, AM 355 was used chiefly. It belongs to a group of metals, including PH 15-7 Mo, Rene 41, and H-11, that is difficult to machine at room temperature.

R. A. Scott, tool engineer on the project, attributes some of the difficulty to: "A rapid work hardening tendency of the material when subjected to plastic deformation . . . and to high tensile strength nearing that of the cutting tool. These factors produce high tool cutting forces, reduce cutting rates and tool life during machining."



This vertical milling machine (driven by a 50 hp motor) was used for experimental cuts on heated workpieces. Spindle speeds range from 14 to 1540 rpm

• **Results**—Since most metals lose strength when they are heated, hot machining can reduce the forces exerted on the cutting tool. As part temperature goes up, the abrading force on the tool is reduced. Tool life does not increase proportionally to temperature, but an optimum temperature is reached. For example, it's 800° F for AM 355, North American found. Above that point, cutter life drops rapidly.

An alternative way to get longer tool life: Boost the metal removal rate and strive for tool life equal to that obtained in room temperature cutting. It was done in the studies by increasing rates four to eight times—depending on the metal and the cut configuration. At 800° F, AM 355 was face milled with a $\frac{1}{8}$ in. deep cut at 850 surface feet a minute and a chip load of 0.0035 in.

Surface finish was no problem during the tests. Parts readily fell within the 125 microinch range. A finer finish can be produced by using finer feeds and lighter cuts.

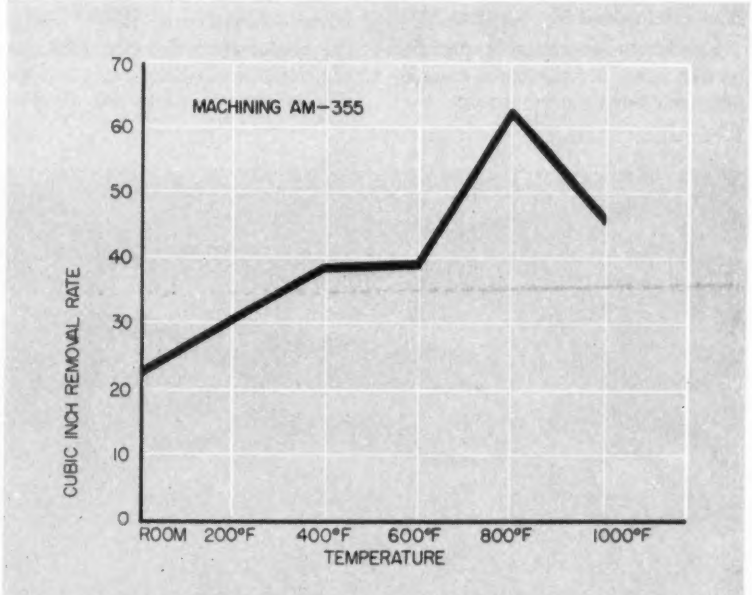
Tolerances were easily held to ±0.010 in.

Some distortion of the workpiece accompanies all hot machining, and must be allowed for, conclude the researchers. To minimize the distortion, the engineers developed a fixture that would heat the whole part, rather than a small layer. One possible way around the distortion problem: Restrict hot machining to the heavy roughing cuts (where conventional machining troubles are at their worst) and depend on room temperature finishing cuts to remove the distortion.

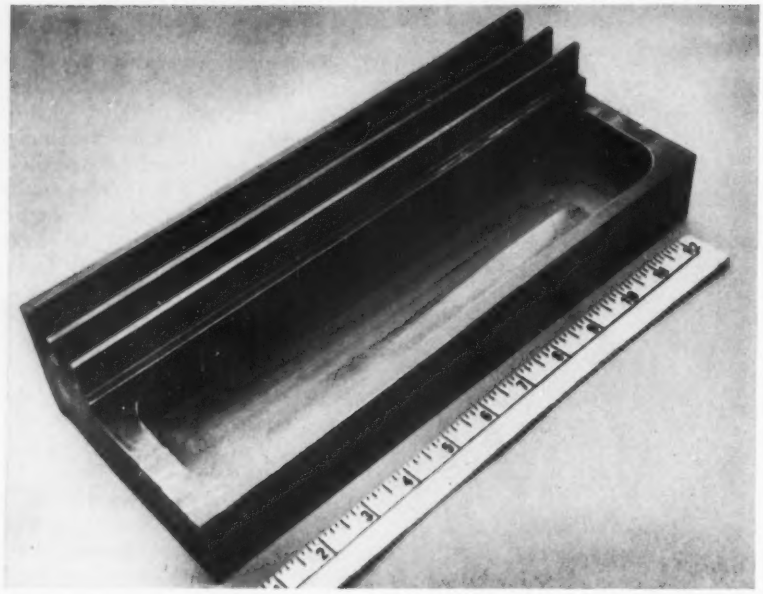
• **Setup**—All tests were run on a Sundstrand vertical milling machine, Model OM 5, powered by a 50 hp motor. Why it was used: The engineers feel that such machine power and rigidity are a must for hot machining.

An Airlox vise and special jaws containing seven Watlow firerod units were mounted on the machine table. Parts were heated to a maximum of 1400° F.

Cutting tools were Grade 6C carbide, the grade the engineers recommend for hot machining. On all large cutters, the carbide inserts



This plot of metal removal rates and part temperatures shows the optimum of 800° F. The tests were done on an eight tooth face mill with 7 degree negative cutting angles. Speed was 550 rpm; feed was 15 in. a minute; and cut depth was 0.100 in.



This part was machined from a 355-Cres solid billet, held at 800° F. Machining rates were up to 850 sfpm, 0.0035 in. chip load. Surface finish is 125 micro-inches. Tolerances were held on some dimensions to ±0.005

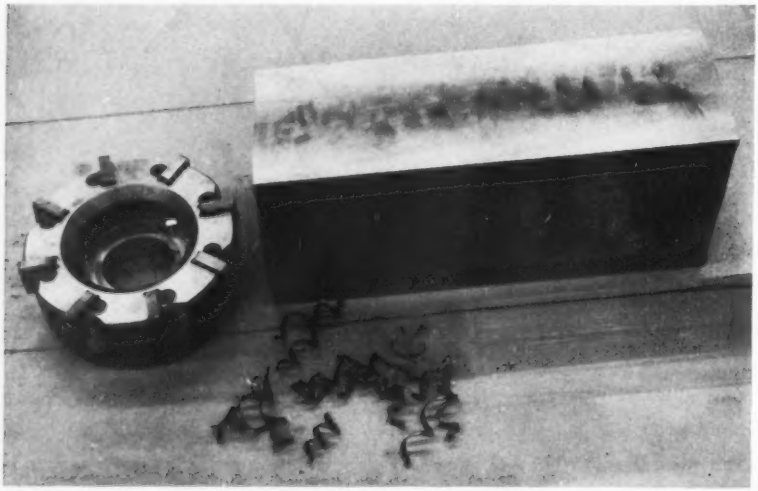
were mechanically held. Small cutters were solid carbide. Brazed type tools didn't work, since the braze failed to hold at the workpiece temperatures.

High speed steel cutters were found unsatisfactory at temperatures over 200° F. They may be used below that temperature but at slow removal rates.

Lubricants are not recommended for elevated temperature machining, concluded the engineers.

• **Limitation**—As a result of tests in the production shop, the production managers found: In face milling wide parts (say 6 in.), the hot machining gain is too small to warrant the complex setup. Reason: The cutters are exposed to the heat over extended periods.

On narrow parts (say 2 in.) where a larger cutter can be used so the blades are not in the heat during the entire cutting cycle, hot machining seems sure to pay off. Further, in milling deep slots with solid carbide cutters, a gain in efficiency of four to eight times has been proved.



Production men at North American have found that cuts this wide are difficult to do hot, since the cutter teeth are exposed to the head for most of the cut

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Swageable Beryllia Beads Put Bend in Thermocouples

Makers of thermocouples are getting an assist from National Beryllia Corp., North Bergen, N. J. The company is producing swageable ceramic insulator beads, important in the manufacture of flexible thermocouples.

The beads are made of beryllium oxide, which has a melting point of 4650° F, permitting manufacture of thermocouples for use in molten metal, combustion chambers, and other ultrahigh temperature applications. Electrical resistance of the material is comparable to that of alumina. It also has characteristics that make it suitable for use in nuclear reactors. Cylindrical in shape, the beads are 1½ in. long and 0.055 to 0.240 in. in diameter. Parallel holes have a diameter one-fifth that of the beads.

Manufacturers string enough beads on the wire pairs of a thermocouple to insulate the desired length. Insulated wires are then placed in a thin wall metal tube. When the tube is swaged, the beads are crushed, forming a dense powder that separates and insulates the wire pairs. Flexibility of the completed thermocouple is limited only by the flexibility of the metal sheath.

Belt Grinder Faces Rails

A portable rail surface grinder using a continuous abrasive belt is announced by National Cylinder Gas Div., Chemetron Corp., Chicago. It is said to resurface rails in half the time required by conventional methods.

Powered by a gasoline engine, the machine contours surfaces built up by welding, or rail ends battered by train wheels. It's pushed along the track by one man; insulated wheels prevent throwing of block signals.

what makes this fastener DIFFERENT?

Several things. Rollpin® is a slotted, chamfered, cylindrical spring pin which drives easily into a hole drilled to normal production standards. It locks securely in place, yet can be drifted out and reused whenever necessary. This eliminates special machining, tapping, and the need for hole reaming or precision tolerances. Rollpin replaces taper pins, straight pins and set screws; for many applications it will serve as a rivet, dowel, hinge pin, cotter pin or stop pin.

And here's another difference that makes Rollpin the quality fastener in the field: ESNA's quality control builds consistent strength and performance into every Rollpin. Rollpin is uniform as to shear strength, dimensions, hardness, and insertion and removal forces.

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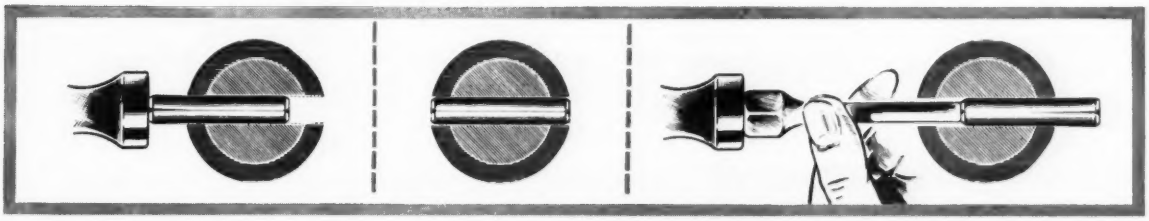

Drives easily by hammer, arbor press, or air cylinder and can be readily adapted to an automatic hopper feed. Requires only a standard hole, drilled to normal production-line tolerances.

Locks securely in place without using a secondary locking device; won't loosen despite impact loading, stress reversals, or severe vibration.

Removes readily with a drift pin without damage to pin or hole, can be used again and again in original hole.

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You pay less for Rollpins than for most tapered, notched, grooved or dowel pins. Installation costs are substantially less than for any fastener requiring a precision fit or secondary locking operations.

Because of their tubular shape, Rollpins are lighter than solid pins. Production maintenance is reduced with Rollpins: they do not loosen and because of their spring action they tend to conform to the drilled hole in which they're inserted, without material hole wear, eliminating the necessity of re-drilling or using oversize pins.

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Standard Rollpins are made from carbon steel and Type 420 corrosion resistant steel. They're also available in beryllium copper for applications requiring exceptional resistance to corrosive attack, good electrical, anti-magnetic, and non-sparking properties. Stock sizes range from .062" to .500" in carbon and stainless steels.

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Wire Coils Get Slow Cooling In Tunnel Annealing Furnace

When steel is so treated, grain structure is improved for cold heading; that makes for longer die life, reduced scrap losses, and better bearing rollers

FORMING properties are often improved by controlled cooling of metal shapes as they leave the hot mill.

Example: Wire used in making roller bearings has better heading qualities when coils are cooled slowly in a tunnel type annealing furnace at Timken Roller Bearing Co.'s Steel & Tube Div., Canton, Ohio.

The furnace, installed by the company at a cost of $200,000, was designed by Timken engineers and metallurgists.

• Wire temperature is held constant about an hour, to improve grain structure.

The nickel-molybdenum wire is used in rollers for tapered roller bearings. Aside from improving cold heading properties, the right grain structure also increases die life, makes for more uniform roller size, boosts production, and cuts down scrap losses in the header department.

Automatic controls hold temperature in the heating zone at about 1400° F. The furnace doesn't raise the temperature of the coils; instead, it lets them cool gradually after they leave the 10 in. wire rolling mill. Time in the furnace: 45 to 60 minutes, depending on the size wire being processed.

• Entry end of the 300 ft furnace is heated by gas burners and lined with refractory material.

The furnace interior is 2 ft high and 4 ft wide. A 30 ft heating zone, at the entry end, is fired by ten gas burners. Top and sides of the furnace are refractory lined for the first 78 ft. (The bottom is made of cast iron plating.)

Counterbalanced lids on the last 220 ft of furnace top can be opened or closed to regulate cooling.

The furnace conveyor can be operated manually or automatically. Speed of the drive can be regulated to match cooling cycles. The return loop of the conveyor is lubricated in a bath of soluble oil and water.

A torque limiting coupling shuts off the conveyor drive if coils become jammed in the furnace, causing an overload. Emergency stop buttons are provided at both ends of the furnace. A two way speaker system permits communication between operators at the entry and exit ends.

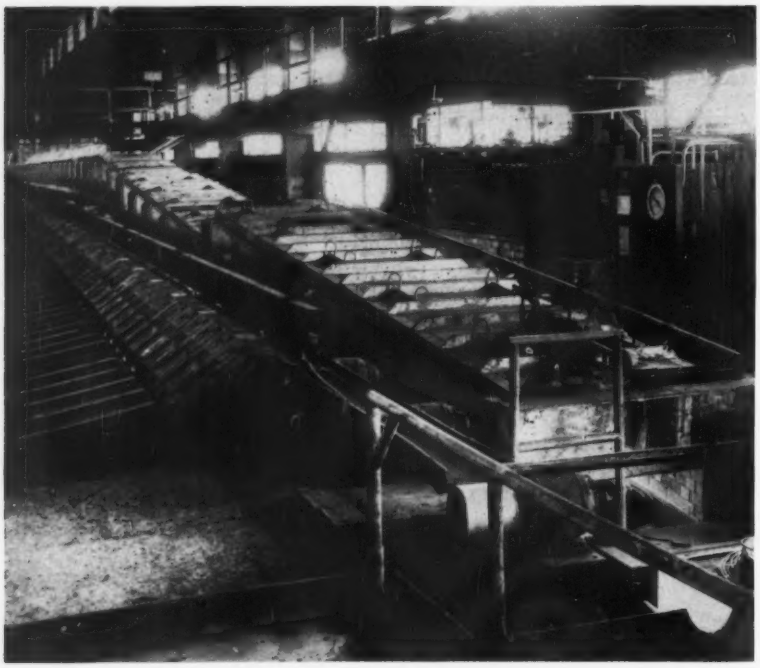
• Conveyor travel isn't continuous. Coils are moved through the furnace 4 ft at a time.

Hot wire lengths leave the rolling mill and pass through a lead-in tube that guides them into the coilers. As lengths pass through the lead-in tube, temperature is checked by an automatic gage. A strip recorder charts the temperature of every second length.

Remote arms push coils from the reels onto a slat conveyor, which moves in either direction so coils not processed in the furnace can be unloaded.

Each coil trips a limit switch as it moves into the furnace. That causes the furnace conveyor to move ahead 4 ft, and discharges a coil at the exit end.

If the limit switch isn't tripped by an incoming coil (because of a delay at the entry end), a timer automatically moves the conveyor, insuring uniform cooling of coils in the furnace.



Coiled bearing roller stock enters the 300 ft long annealing furnace. As each coil actuates a limit switch at the entry end, the conveyor moves ahead 4 ft

MESTA ROLLS

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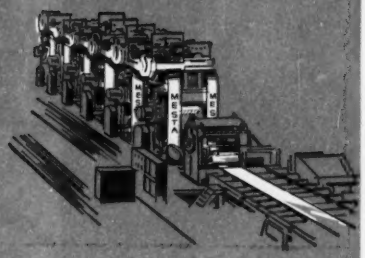

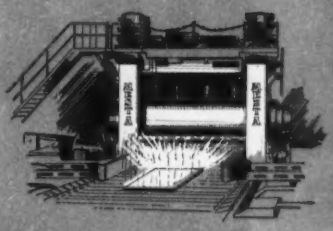

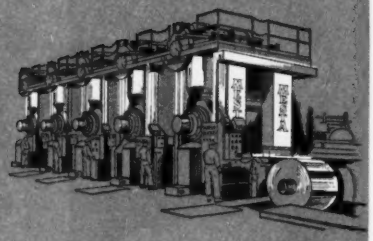

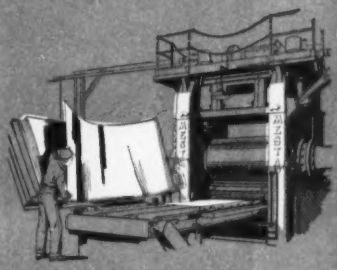

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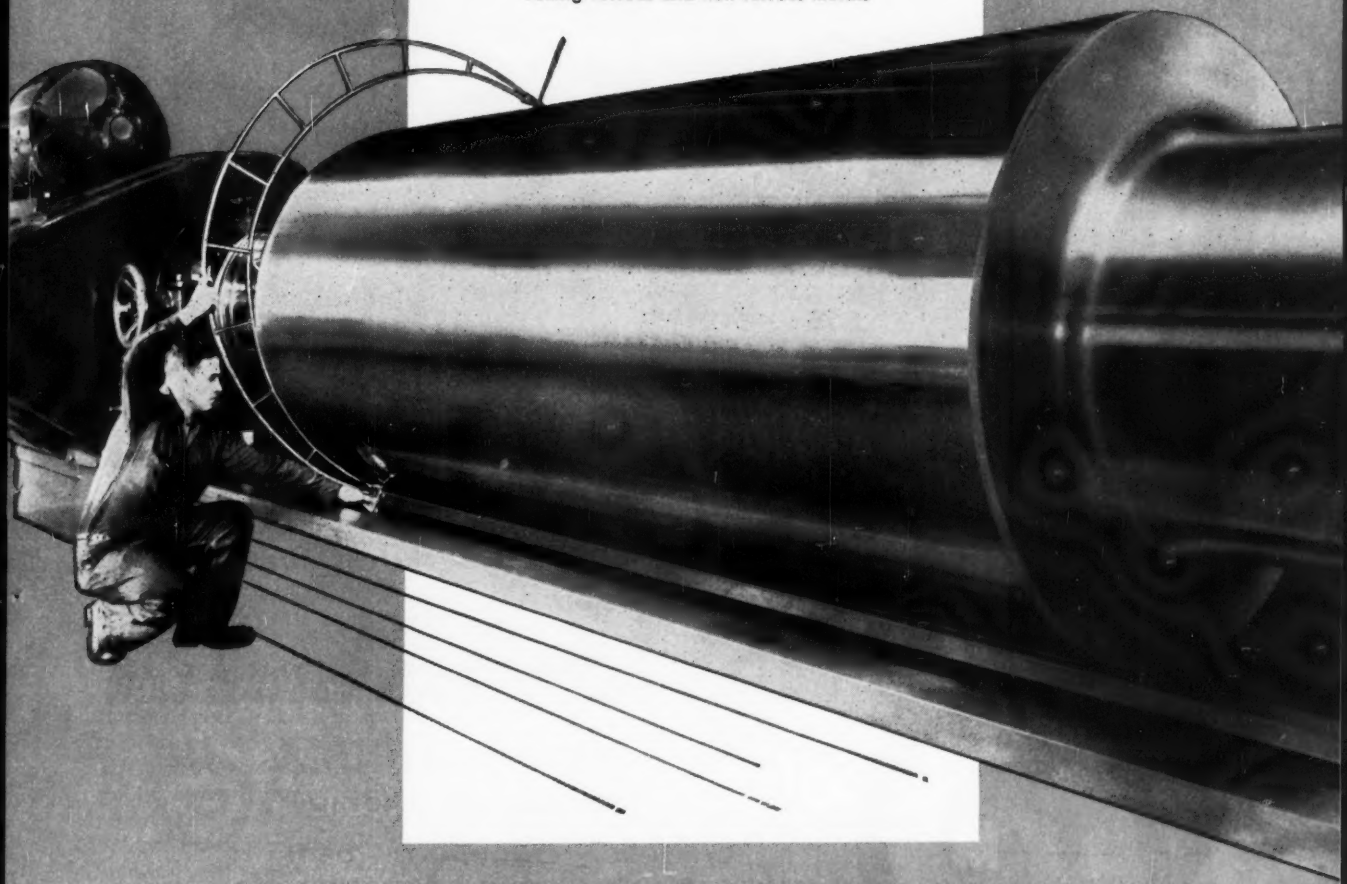

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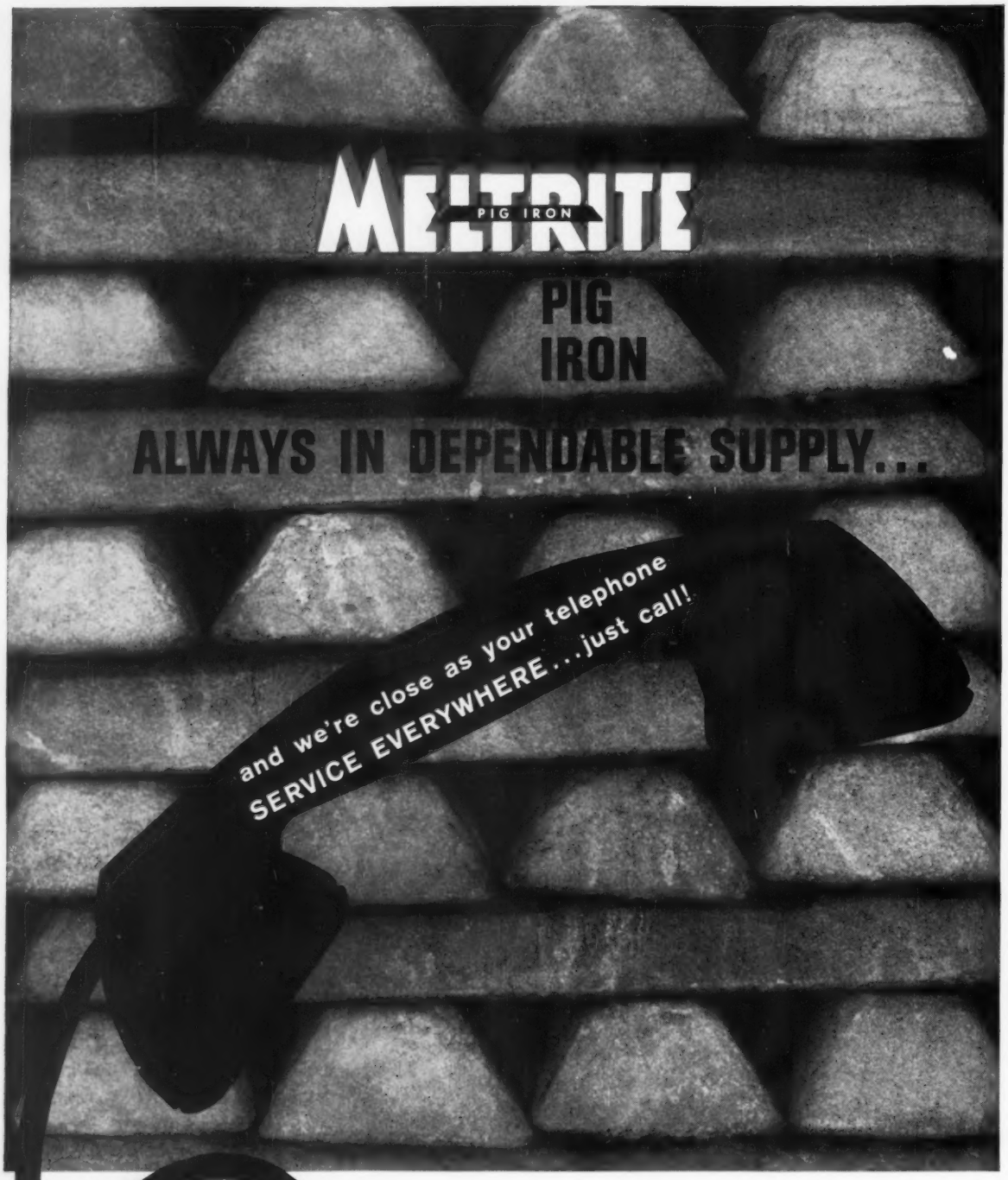

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Numerical Control Gets Strong Boost

West Coast builder says its economics and reliability have been proved—and he has success stories to back him up. Careful selection is the key, he claims

NUMERICAL control still has to prove itself to many machine tool users and builders, but at Burg Tool Mfg. Co. Inc., Gardena, Calif., the concept is taken for granted.

Joseph L. Burg, vice president in charge of sales and engineering, told STEEL his company has already shipped 74 of its turret drilling machines equipped with point-to-point positioning control on the table and cycle control on the machine.

He says roughly 60 per cent of the company's dollar volume and one-third of its shipped machines represent tape controlled units.

• Careful selection can get you control reliability.

Mr. Burg comments that much of the reported trouble with controls can be attributed to tinkering that isn't necessary. He feels that once the normal setup and run-in kinks are ironed out, most installations are as troublefree as other systems.

Customer return is a much more important figure than initial cost, says Mr. Burg. He estimates that 90 per cent of numerically controlled machines his firm sells pay for themselves in two years or less.

At Rocketdyne Div., North American Aviation Inc., for example, a $70,000 machine paid for itself in the first year.

One customer used to take 6½ hours to make a complex part on a jig borer. After a subcontractor built two $4000 fixtures, the job took two men only 1½ hours. Now the customer makes the part on a numerically controlled machine in 25 minutes, and operator attention is not required during the cycle.

Another user completes a part in the time it formerly took to load and unload the part and fixtures.

On a job now being proved at the builder's plant, a series of holes in a 6 x 6 in. plate is being held to a center line distance tolerance of ±0.0005 in.

Those are typical results Mr. Burg feels the user ought to expect from numerical control.

Drill Longevity

A-286, one of the prime aircraft steel alloys, is throwing some curves at the production men who have to machine it.

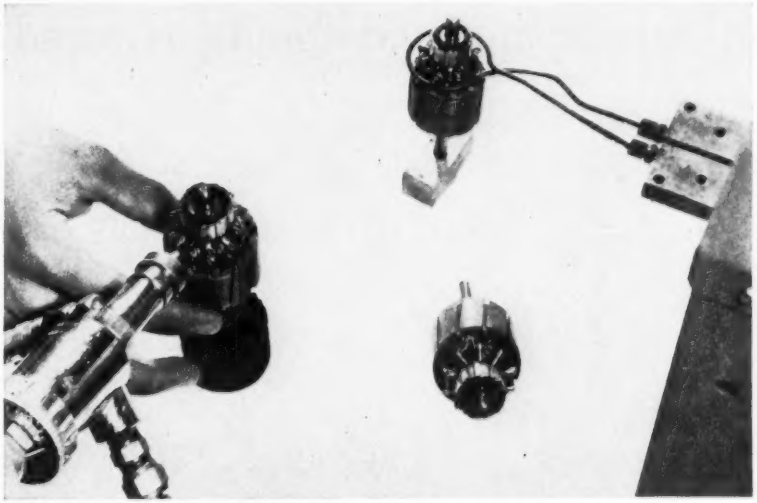
They will be amazed by the results with A-286 on a drilling job at Marquardt Corp., Van Nuys, Calif.

A conventional, high speed steel, twist drill with oil holes to lubricate the tip had a life of more than 30 linear ft.

Marquardt spokesmen feel the secret to longevity (several drills were tested to prove the first result was no fluke) is simply good, conventional machining practice. The drill was ground with a 140 degree included angle, a 5 degree positive rake angle. Recommended speeds and feeds were used. Much of the credit is given to machine rigidity, a must in drilling alloys that work harden readily.

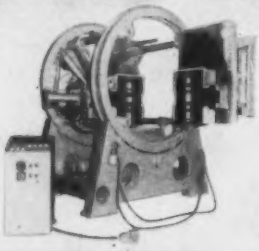
High Velocity Machining

Some students of ultrahigh velocities for machining predict: Electron beam machining or some similar impact technique that fires low mass particles at workpieces may be a production technique of tomorrow. It would overcome the tremendous problem of rotating heavy workpieces, chucks, or tools at high rates.



A SOLDER-FLUX PASTE DISPENSER AND AN INDUCTION HEATER have lowered costs for a maker of electric motors. They have cut soldering time from 60 to 9 seconds on armature assemblies. The dispenser, above a rotating fixture, ejects a drop of solder on each of 12 armature eyelets. The solder is melted and flowed by the heater. That's a completed assembly below the one being heated. The procedure eliminated full time help for inspection and resoldering of rejected parts. Fusion Engineering, Cleveland, is responsible for the idea

The Shalco Corporation, pioneers in Shell Core Blowers



and Shell Molding Machines, joins forces and becomes a Division of the National Acme Company, pioneers in automatic multiple-spindle bar and chucking machines

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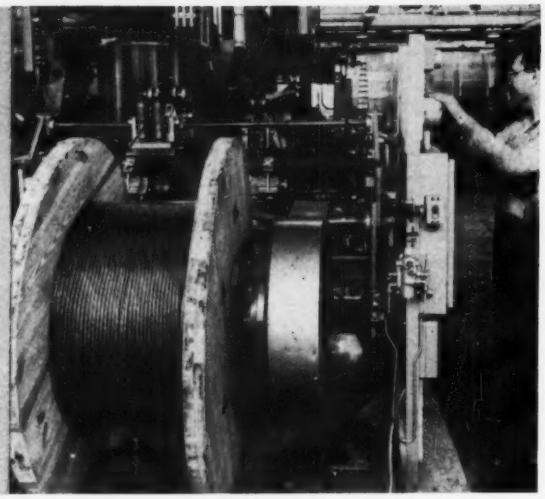
T. L. Stimpel

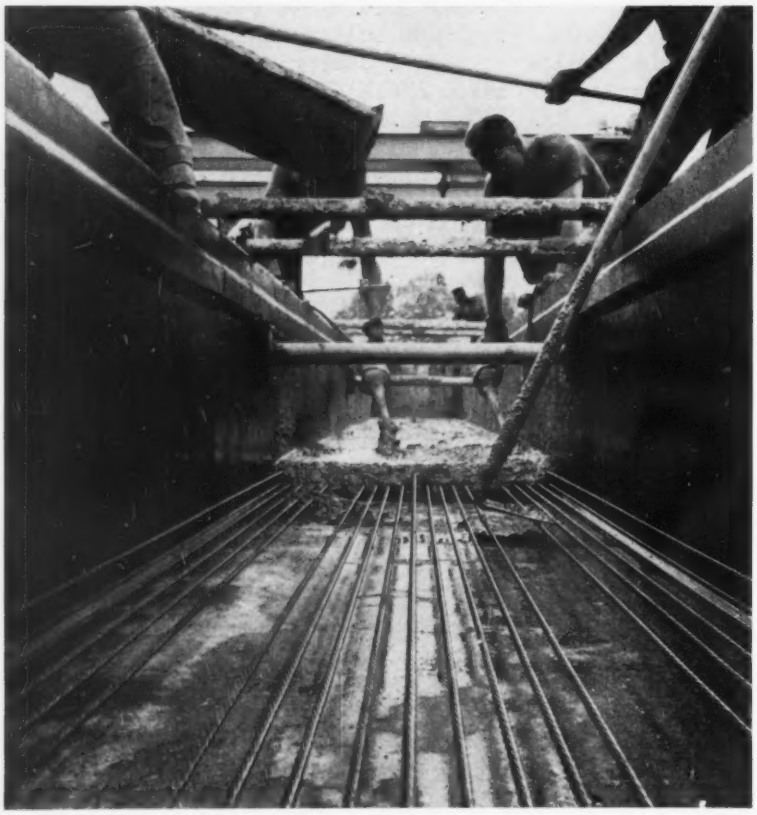
President
The National Acme Company

Bethlehem Develops Stress Relief Method

Induction heat treating gives concrete reinforcing strands uniform mechanical properties from one reel to another, or in any given reel



REINFORCEMENT of concrete with prestressed strand helps it take severe tensile loads without cracking. Reason: Steel cables, under stress when concrete is poured, apply a uniform compressive force to structural members after they're seasoned. When the members are put under tension, reinforcing strands are stretched, but the concrete merely assumes its normal, "no load" dimension.



Strands heat treated by the new method are easy to handle in concrete casting beds. Clean surfaces make for good bonding with concrete

Elastic properties ideal for prestressed reinforcement are introduced by induction heat treating at the Sparrows Point (Md.) plant of Bethlehem Steel Co.

• Induction stress relieving makes the strands easier to handle and helps them take heavier tensile loads.

Hard drawn high carbon steel wire used in making stress relieved strand is stiff and hard to handle. The company's method of preforming wires as they are stranded and the heat treating method used later produce a strand free from appreciable wildness. That's important to workers using the material in concrete casting beds.

After extensive research, Bethlehem chose the induction heat treating method. Precise temperature control makes for uniform mechanical characteristics from reel to reel, or in the length of material wound on any given reel.

Strand that is stress relieved by the induction method is cleaner than that turned out by other processes, company engineers report. Result: The surface bonds more readily with the concrete.

• Strand is available in a number of lengths and gages.

The material is produced in seven wire strands, $\frac{1}{4}$ to $\frac{1}{2}$ in. in diameter, to meet ASTM specifications. And continuous strand is available in long lengths. A single reel holds 15,000 ft of $\frac{3}{8}$ in. reinforcement.

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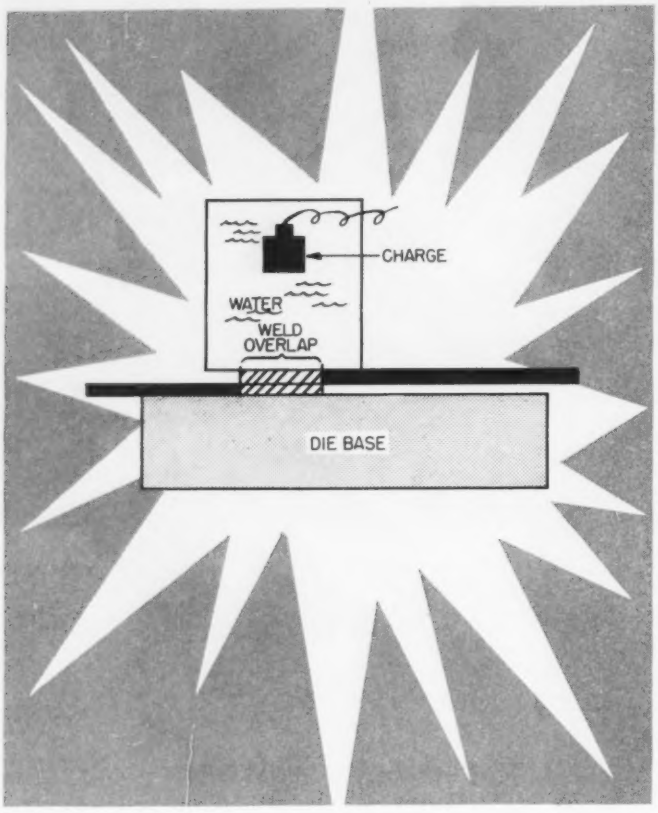
Explosive Welding Is on the Way

Welding depends on explosive pressure wave being transmitted by a fairly dense medium (like water) to the weld area. Deformation of the metal is slight



Photomicrograph of copper-to-copper weld shows thin line along joint. Some rearrangement of slip planes may occur, accounting for joining

Experts report they're getting good bonds with a variety of metals and alloys. Technique can be incorporated in explosive forming. Needed: More data on physical properties

WELDING of metals with explosives is only a step away from commercial reality, predict experts at National Northern Div., American Potash & Chemical Corp., West Hanover, Mass. They have had promising results in joining:

Aluminum to aluminum.
Aluminum to stainless steel.
Aluminum to nickel alloys.
Stainless steel to stainless steel.
Stainless steel to nickel alloys.

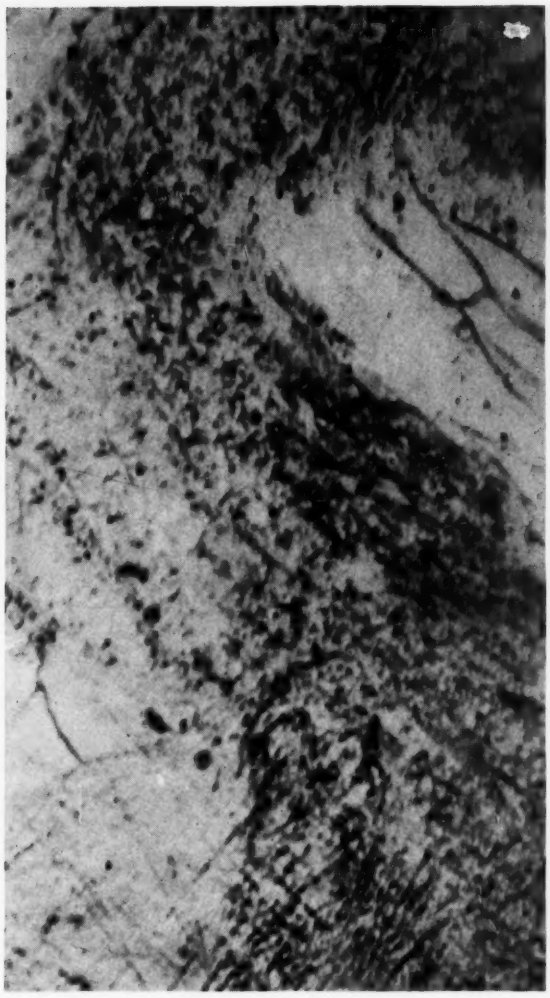
Other benefits are listed by Vasil Philipchuk, manager of the firm's special projects department: 1. You can join areas impossible to reach with ordinary welding equipment. 2. Since no heat is used, the method eliminates heat-affected zones. 3. Joining equipment isn't bulky or expensive.

National Northern has applied for a patent on its process.

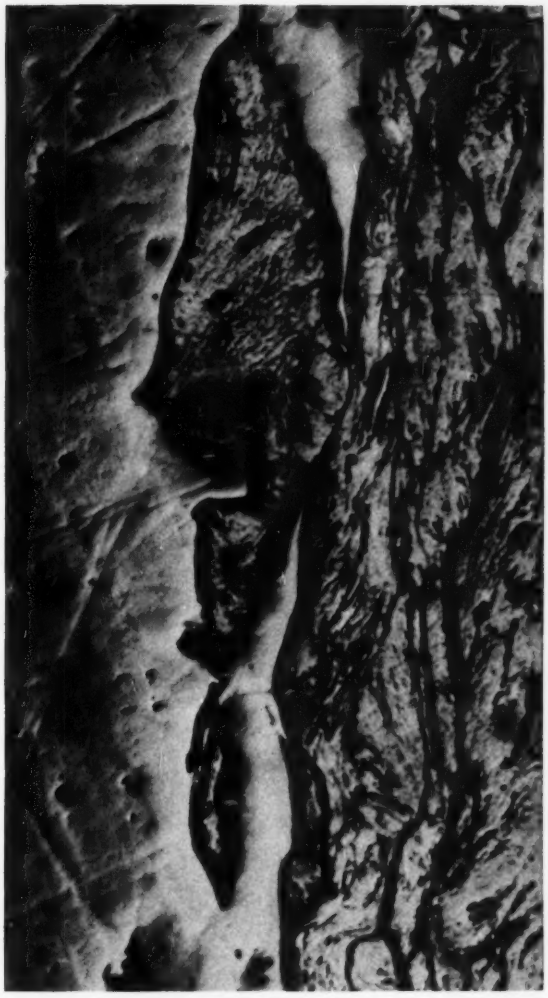
• **Discovery of the bonding principle was accidental. Techniques resemble those used for explosive forming.**

Frank Bois, project engineer for National Northern, detected the welding principle while forming an aluminum blank into a deep U-channel. He found that the aluminum had melted and fused to the steel die, yet no heat had been added—in fact, the operation was done under water.

Procedure: Two metals are placed so they overlap in a die (a strap can also be used). A properly placed charge is then detonated (water transmits the shock wave). The explosive force "instantly" squeezes the metal into a bond. (It may be called a weld, a cold weld, or a bond). Techniques and the



Low carbon steel parts have this kind of microstructure at the interface. Studies of such bonding are in preliminary stages at the U.S. Naval Ordnance Station



Opposed pistons of a small press at the China Lake Test Station develop 1 million psi to press iron and titanium filings together. Micrograph shows intimate bonding

degree of bonding depend on the kind of metal being joined.

• The majority of the work has been on flat sheets. National Northern is also bonding tubing to tubing.

The joining or locking of tubes seems to offer some potential for: 1. Corrosion resistant liners in comparatively inexpensive, carbon steel tubes. 2. Application of harder metals at wear points. 3. Watertight connections.

Some combinations require careful sizing of metal and tubing, plus careful calculation of explosive size, location, and geometrical shape to get the necessary bonding or locking in the right places. A backing die is needed for most small units.

• Similar work is being done by Dr. John Pearson, U. S. Naval Ordnance Test Station, China Lake, Calif.

"We are investigating some novel methods of explosively bonding metal parts, but we haven't reached the point where we can discuss techniques," he states, adding: "The method has some merit."

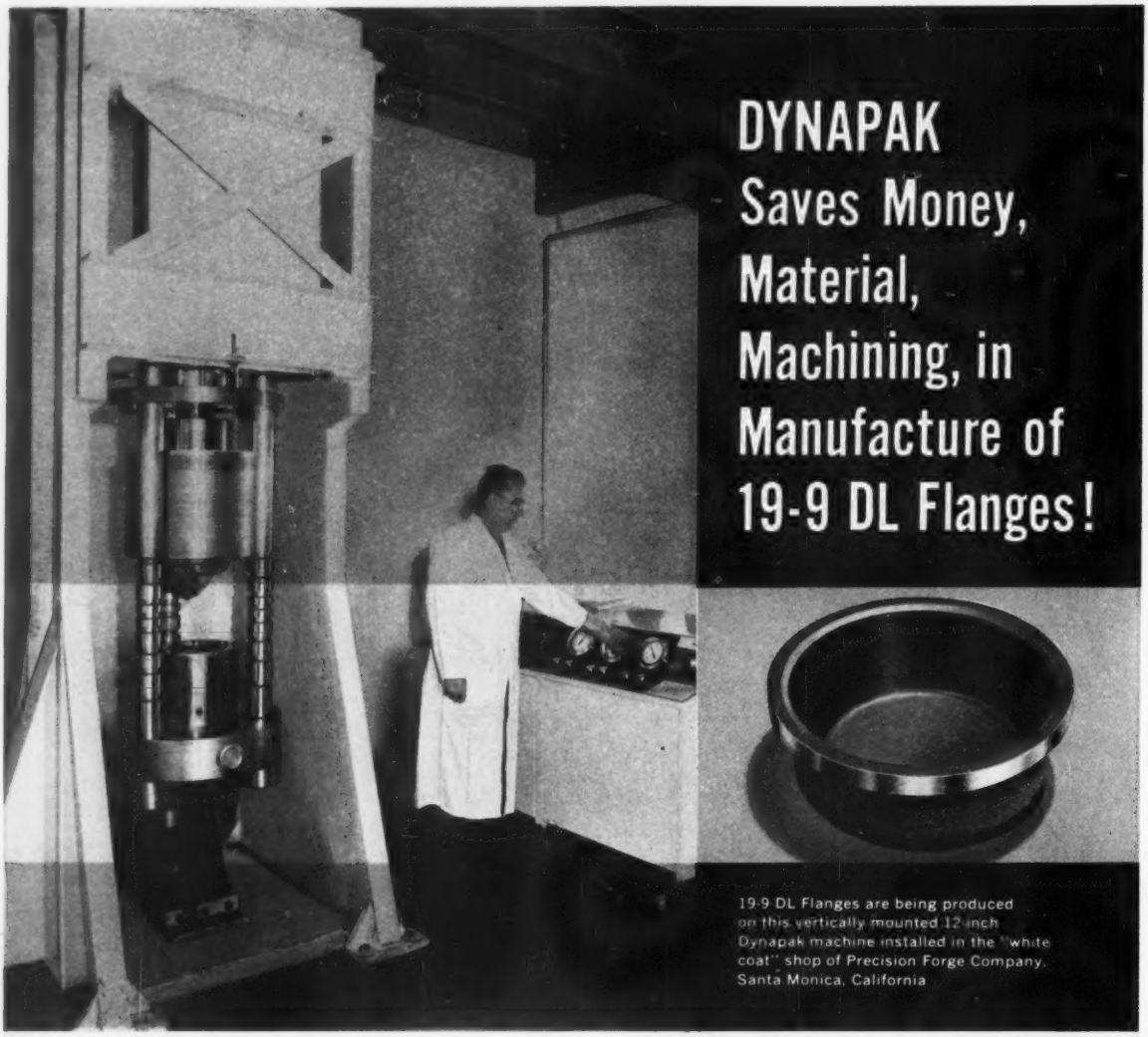
China Lake projects include the joining of iron and titanium filings and other dissimilar metals in an explosively actuated press.

• Researchers emphasize that physical testing and additional data are needed before the method can be put into commercial use.

Lacking are measurements of the bond strength in finished assemblies as well as photomicrographs which indicate complete bonding of areas under test. In addition, improved techniques are needed for handling high temperature metals.

Outlook: Explosive welding may solve a number of specialized problems in nuclear reactors and similar heat exchanger applications. Firms already doing explosive forming might well add a welding operation at no additional expense.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.



DYNAPAK Saves Money, Material, Machining, in Manufacture of 19-9 DL Flanges!

19-9 DL Flanges are being produced on this vertically mounted 12-inch Dynapak machine installed in the "white coat" shop of Precision Forge Company, Santa Monica, California

Here are the savings achieved in this Dynapak Application:

- MATERIAL: 60%
- TOOLING: 50% of the cost of conventional forging dies
- MACHINING: Reduced by more than 50% due to forging tolerances of $\frac{1}{32}$ in. and elimination of draft angle.

PLUS

- PRODUCTION RATES: 70-80 per hour
- SUPERIOR PHYSICAL CHARACTERISTICS: Greater strength, uniform and controllable work-hardening, Grain Size No. 11.

Dynapak, industry's first operational high-energy-rate machine tool, offers a breakthrough in metalworking's long-sought goal to produce forgings that can be used with little or no machining. This flange is just one of many forgings now being produced commercially by Dynapak. For complete information regarding application of pneumatically-energized Dynapak in your forging, extrusion, forming, or compaction operations, write, wire, or phone:

DYNAPAK

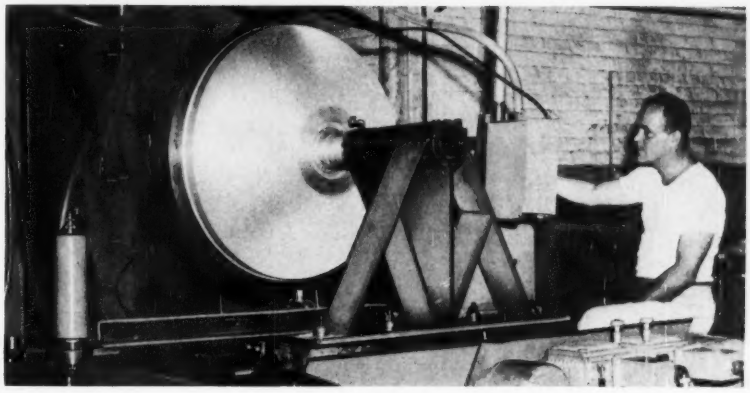
CONVAIR / A DIVISION OF GENERAL DYNAMICS CORPORATION

1243 Transit Avenue, Pomona, California • Telephone: NAtional 3-1561

Two Dimension Tracer Has Electromechanical Control

THE Seneca tracer system is electromechanically controlled and will follow contours around a 360 degree path at constant speed—regardless of direction, says the maker. It's available as a package and can be easily adapted to existing machine tools.

The value of the cutting speed can be varied manually, or automatically as a function of spindle speed (to maintain a constant feed rate in inches per spindle revolution).



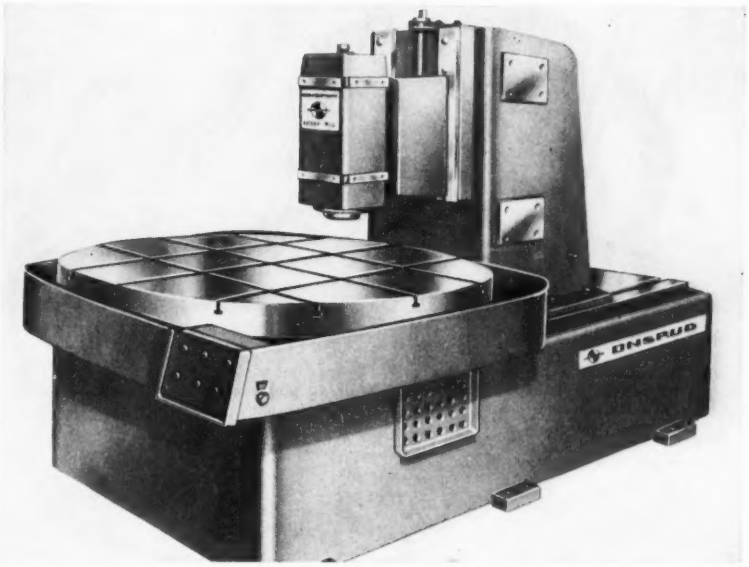
Operation: The stylus assembly (on contact with the template) feeds electrical signals to servo systems. The signals are boosted to actuate a mechanical amplifier which controls table movement. The stylus rotates eccentrically.

Other features: 1. The stylus can approach the template from any angle. 2. The system will automatically compensate for tool wear by varying the eccentricity of the stylus. 3. The stylus assembly servo motor permits remote manual control at the table, provides constant bias torque for automatic operation, and permits automatic tape or card control (without a template). 4. The system can produce oversize template duplicates in controlled steps to facilitate removal of material that cannot be taken off in one pass.

For further information, *write* Seneca Falls Machine Co., 20 Fyfe Bldg., Seneca Falls, N. Y.

Face Milling Machine Combines High Speeds, Feeds

WITH this rotary table unit (Onsrud MM-48 Mach-Mil), you can get high productivity and accuracy in milling aluminum and other nonferrous metals. The basic unit has a single vertical head for face milling. A second milling head makes possible in a single pass such double operations as roughing and finishing, face milling and profiling, or milling at two elevations.

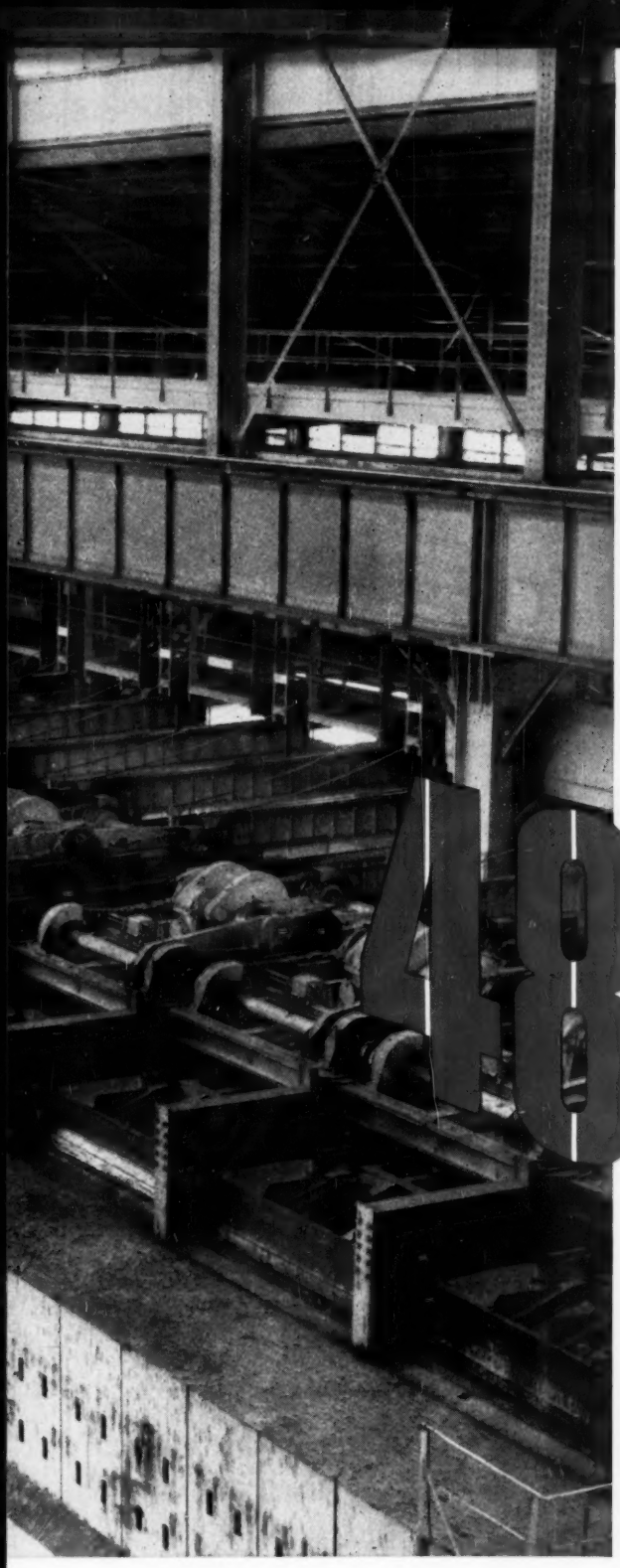


The table has a work surface diameter of 48 in. Vertical adjustment of the head ranges from 2 to 15 in. (measured from table surface to spindle nose). The adjustable column position provides a radial adjustment of the milling head relative to the table ranging from 12 to 28 in. (from table center to projected axis line of the spindle).

The standard table drive has an

This is the largest installation of soaking pits ever built at one time. It will heat an average of 750 tons of ingots per hour. At peak capacity, it will fill the ingot buggies at a rate of 1200 tons per hour.

Worldwide engineering and manufacturing facilities through associates in Australia • Belgium • France • Germany • Great Britain • Italy • Japan



■ Forty-eight soaking pits on *one order*. There's a bold act of customer confidence for you! Confidence in the future, for one thing. Confidence in the principle of the Surface one-way fired soaking pit with the jet pump recuperator system. Many other steelmakers have shown similar faith in Surface—a source of pride, matched by our determination to deserve it, ***wherever heat is used in industry***

48 PITS

SURFACE COMBUSTION CORPORATION

2408 Dorr Street, Toledo 1, Ohio

Surface

infinitely variable peripheral feed rate of 18½ to 150 in. a minute (37 to 300 in. a minute with the optional drive).

For further information, *write* Onsrud Machine Works Inc., 7720 Lehigh Ave., Niles 48, Ill.

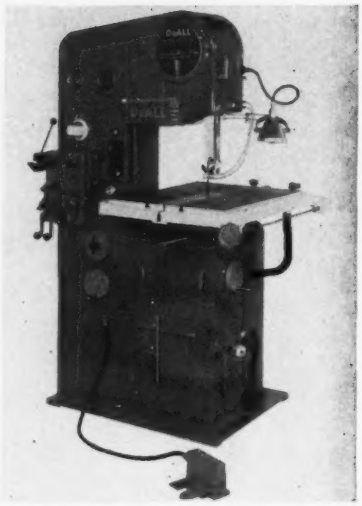
Band Machine Models Have Greater Capacity

MAXIMUM cutting rates, minimum upkeep, and operator convenience are features of the Contour-matic sawing machines (Models 1612-3, 2613-3, 3612-3, and 6013-3). You can get throat depths of 16, 26, 36, and 60 in. The work heights are 13 in. for Models 2613-3 and 6013-3, and 12 in. for Models 1612-3 and 3612-3.

The units have dial type band tension indicators. With the indicator, you can eliminate guesswork by giving the proper tension for any width of any type sawing, filing, or polishing band within the machine capacity. That includes the Demon high speed steel saw band up to ½ in. wide and carbon steel bands up to 1 in. wide.

An improved drive mechanism is used for longer belt life. All Contour-matics use three speed transmissions and infinitely variable drives.

A companion line of heavy duty machines is also available. They're similar to the Contour-matics, but are without power operated worktables or circulating coolant systems.



For further information, *write* DoAll Co., 256 N. Laurel Ave., Des Plaines, Ill.

RAYTHEON'S 2500 WATT ULTRASONIC IMPACT GRINDER can cut areas up to 3½ in. in diameter in hard or brittle materials like carbides, ferrites, ceramics, and semiconductors. Slicing, drilling, grinding, and trepanning can also be done with the unit. It's especially suitable for making unusual cuts not easily ground or molded. Tolerances are within ± 0.0003 in. Operating frequency of the tool head is 20 kc. For details, write Raytheon Co., Waltham 54, Mass.

Rotary Swaging Machines Reduce Solids, Tubes

SOLID material from 0.010 to 2.25 in. in diameter and tubing up to 6 in. in diameter can be reduced on the Torrington rotary swaging machines.

Lengths of tapers permissible on a single pass vary from 6¾ to 11¾ in. for solid stock, and up to 14¾ in. for tubes. Forming, joining, reducing, tapering, or sizing can be done without chip loss.

Surface hardness and strength of both ferrous and nonferrous metals is improved by the grain refining and rearranging in the swaging process. Close tolerances can be held and finishes are smooth.

For further information, *write* Torrington Co., 1000 Clark St., Torrington, Conn.

Air Staker Combines Arbor Press, Staking Functions

PRESSING or staking operations can be performed independently or combined in rapid sequence on the Cramer air staker. Force of the staking blow can be adjusted from 15 psi to line pressure by a regulator on the air valve. The quick acting valve permits a series of light blows (preferable with materials like nylon or the phenolics).

Operator fatigue is eliminated in

NEW WAY TO UPGRADE YOUR PRODUCTS: VINYL COATINGS

Pleasant-to-touch, glare-reducing dashboard finished with a vinyl dispersion that *creates its own patterns.*

For "leather-like" coverings for metal desk, file cabinets, and office appointments...

For stamped, light-metal luggage; instrument cases; office-machine housings...

Thin, leathery, "textured" finishes for metal

Something new in metal finishing: leather-like, warm-to-the-touch finishes that heat-cure to a textured finish. It's actually "texture in paint!" The base material: abrasion-resistant vinyl (of hard-wearing floor-tile fame) formulated as a dispersion for spray or dip coating. A single coat provides the complete finish. You can specify any shade or tone of color.

Short heat-cure at moderate temperatures adheres the vinyl permanently to the metal. These vinyl-dispersion finishes are so flexible, adhere so tenaciously, that prefinished sheet metal can be stamped to shape without need for final finishing.

Write for sources of vinyl in liquid form for coating metal, glass, or wood. Get a head start on investigating the profitable ways to use these new, textured, leathery finishes. Write today!

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Monsanto manufactures a wide variety of plasticizers and Opalon® resins for formulators of these high-quality vinyl dispersions.

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New High-Strength Material Extends Superior Line of Stainless Steel Tubing Analyses

PH 15-7 Mo, a new precipitation-hardening stainless steel analysis, possesses excellent mechanical properties at room temperature, outstanding ones at elevated temperatures. In addition, it is readily fabricated in the annealed condition, exhibits good corrosion resistance characteristics, can be hardened by heat treatment with minimum distortion.

Tubing of this new analysis is recommended for aircraft structural parts, studs and bushings, Bourdon springs and torque tubes in instrumentation, tubular springs, and hydraulic lines where severe bending and forming are required. It is available in WELDRAWN® form in size range from .012 through 1.125 in. OD.

In addition to PH 15-7 Mo, Superior offers the widest variety of analyses in the small-diameter tubing industry—over 120. This range permits you to specify the right one for your particular application. For complete information about PH 15-7 Mo and other analyses available for your needs, write Superior Tube Company, 2005 Germantown Ave., Norristown, Pa. *Reg. U.S. Pat. Off., Armco Steel Corp.

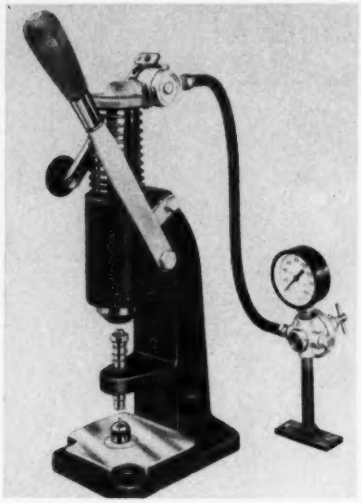
Superior Tube

The big name in small tubing

NORRISTOWN, PA.

All analyses .010 in. to 5/8 in. OD—certain analyses in light walls up to 2½ in. OD

West Coast: Pacific Tube Company, Los Angeles, California • FIRST STEEL TUBE MILL IN THE WEST



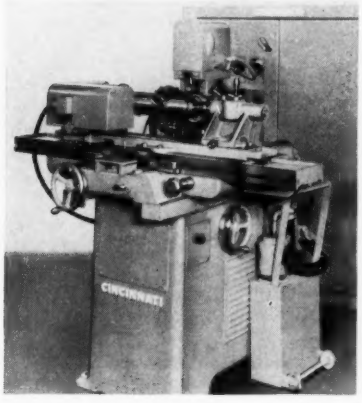
heavy pressing operations where considerable force would be needed on the arbor press lever. The workpiece is held down with the arbor press and an air hammer delivers a series of blows to the holddown punch.

For further information, *write* Cramer Controls Corp., Miller Street, Centerbrook, Conn.

Cutter Grinder Has Automatic Cycle

AFTER setup, this cutter grinder will sharpen identical cutters without attention from the operator. Consistency of grinds from cutter to cutter increases number of pieces machined between sharpenings, says the company. Righthand or lefthand, plain or stagger tooth cutters can be ground.

A cost and time saving advan-



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Whatever your corrosion problem, Harper has the corrosion-resistant fastening to answer your need. Stainless Steels, Monel, Silicon Bronze, Naval Bronze, Brass, Copper, Aluminum, Titanium are standard metals at Harper. *In fact,* during the past 35 years, Harper has manufactured over 100 different corrosion-resistant alloys into HARPER EVERLASTING FASTENINGS. Millions of standard and non-standard items are carried in stock by Harper and Harper Distributors. See how Harper corrosion-resistance can help you. Write for the facts.

Pouring silicon bronze at The H. M. Harper Company, Metals Division

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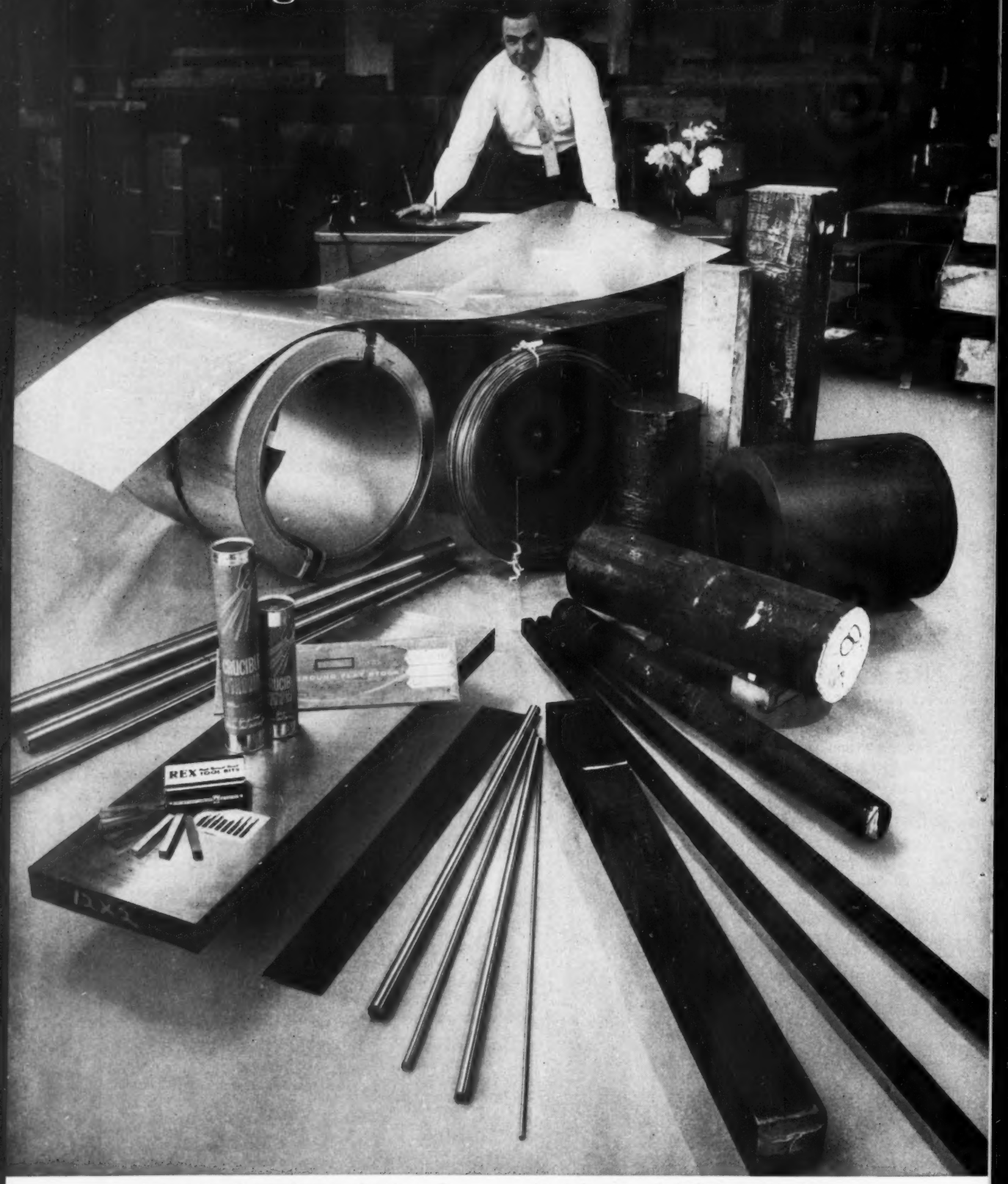
Gentlemen:

Please send me your report on "Corrosion Resistance" at no cost or obligation.

integrated CRUCIBLE steel service



Average Crucible warehouse stocks these and many other specialty steel items in a tremendous range of sizes and analyses. A single phone call will bring any or all of them to you *in the quantity you need.*

keeps 16,000 specialty steel items flowing from mills to local warehouses for immediate delivery to you

Every day, thousands of specialty steel items flow from Crucible mills to Crucible's 31 strategically located warehouses – keeping local stocks at levels that meet customers' *maximum* needs.

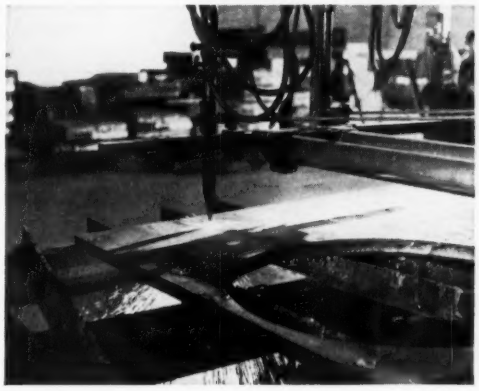
Here's how these continually-replenished stocks are helping one steel buyer today. He says:

"We reduced plant inventory to cut operating costs and free working capital and space. This is smart business. But it creates problems, too–like when production requisitions an extra-large order of 36" x 120" Type 304 stainless sheet, 20 ga and 2B finish – *and needs it overnight.* I solve this problem by calling the Crucible warehouse. It's set up to give us the kinds of steels we need from stock."

All 31 Crucible warehouses offer in-stock delivery of approximately 16,000 specialty steel items, ranging from tool steels to stainless sheet and wire. They're able to maintain these high inventories because they're part of Crucible's completely integrated operation, from mining the ore to steelmaking to warehouse delivery to you. If you'd like to know all the ways these warehouses can serve you, phone or visit the one near you today. *Crucible Steel Company of America, Dept. PK-15, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

Inventory specialists keep warehouse stock records up-to-date to give you fast, accurate answers on availability of every analysis.

Steels you ordered yesterday arrive today at your receiving platform — dependably on schedule.



Warehouses maintain modern equipment, like this electronically-controlled flame cutter, for fast processing of specialty items.

STOCK LIST

Keeps you up-to-date on local stocks of specialty steels. Just ask the Crucible salesman to place your name on the regular mailing list.

One Source For All These Steels

TOOL STEELS–Water, oil, air hardening, shock resisting, hot work, plastic and die casting steels in all forms, including bars, sheets, plates, drill rod, hollow bars, forgings and flat ground stocks

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FREE MACHINING STEELS – Crucible Max-el® rounds, hexagons, plates and brake die steel
ALLOY STEELS – Bars, billets, strip and sheet
COLD ROLLED CARBON SPRING STEELS
DRILL STEELS – Hollow and solid drill steels
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HOLLOW TOOL STEEL
HARD FACING ROD
PLASTIC MOLD STEELS
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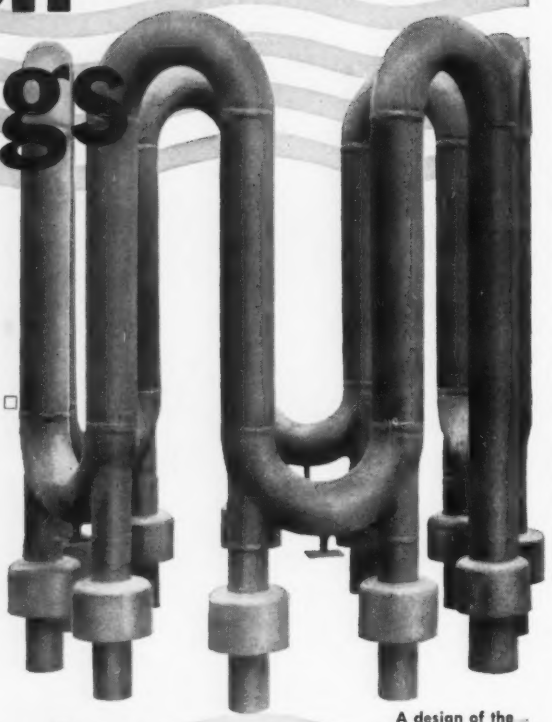
when things are HOT... call on Duraloy



A design of the A. F. Holden Co., Detroit, Mich.

Castings that Keep their Load-Carrying Strength at High Temperatures

This "immersion type radiant heater" is typical of the high reliability castings turned out by DURALOY. Centrifugally cast tubes with *UNIFORM* wall thickness...for longest service life. Static cast collars and shell molded bends...typical of DURALOY versatility.

For your high alloy casting requirements check with DURALOY... our long experience, ultra-modern foundry and up-to-the-minute test equipment will be helpful in solving your problems. For more information ask for Bulletin No. 3150 G.

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DETROIT OFFICE: 23906 Woodward Avenue, Pleasant Ridge, Mich.

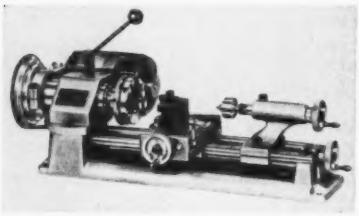
tage of the machine is automatic grinding wheel truing. The operator programs the number of teeth that will be ground between truings and the passes of the diamond that will be required.

To assure concentricity, the cutter grinder has a counter to permit 180 degree cutter rotation after the first rough grind revolution. Effects of tool wear are minimized. Eight counters on the machine panel permit quick selection of the desired cycle.

For further information, *write* Cincinnati Milling Machine Co., Cincinnati 9, Ohio.

Versatile Machine Tool Handles Small Parts

SMALL part tooling can be done with tolerances down to 0.004 in. on the Unimat machine. The basic unit can be set up as a lathe, drill press, milling machine, tool grinder, polisher, and hand drill.



Motor, drill chuck, and other accessories are provided.

For further information, *write* Unimat Div., American Edelstaal Inc., 350 Broadway, New York, N. Y.

Feeder, Straightener Takes Widths to 50 in.

FEATURES of a roll straightener and an automatic feeding machine are combined in the Benchmaster unit. It is obtainable with either one or two electromagnetic drive clutches (controlled by an adjustable feed length measuring "timer").

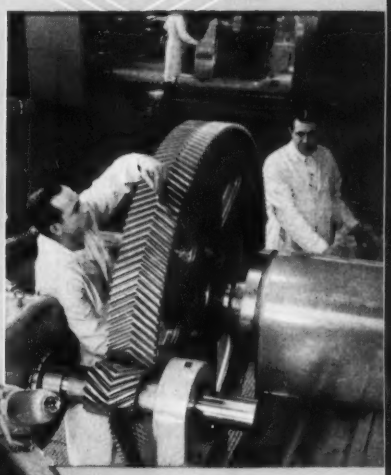
The machine can feed uniform, controlled lengths of coiled, flat, or strip stock. It smultaneously passes them through a series of powered

Here's how Illinois Gear makes sure of Quality in HERRINGBONE GEARS

If you could look down into the ILLINOIS GEAR plants you would see great batteries of the world's most modern gear producing equipment . . . manned by skilled craftsmen who *know* how to operate this equipment.

Typical of what you would see is the precision Herringbone Gear Generator and Testing Equipment, illustrated here. With unmatched facilities such as these ILLINOIS GEAR can produce one gear, ten thousand or more under the most exacting conditions of quality control . . . and meet delivery dates as promised.

If you are not now using ILLINOIS GEARS find out about the gears that can be made in any quantity with quality as the first consideration, as thousands of customers can testify.



Power testing Herringbone Gears under actual operating conditions.

The Herringbone Gear Generator has a 66" diameter and 18" face capacity. Other generators up to 134" diameter, 54" face capacity.

Look for this mark ILLG® *the symbol on finer gears*

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THE ORIGINAL ALLOY STEEL CHAIN

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Herc-Alloy is sold in running lengths and in all types and sizes of sling chains assembled to customers' specifications. CM also produces a complete line of chain attachments and welded chain of all types including stainless steel.

● Write for Data Book covering Herc-Alloy Sling Chains, including helpful information on their assembly, care, use and inspection.

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COUPLING LINKS

● Assemble or rebuild your own Herc-Alloy sling chains with all components furnished by your local distributor. Hammerlok is simple, safe, reusable. New Herc-Alloy assemblies can now be ordered with welded or Hammerlok Coupling Links as desired.

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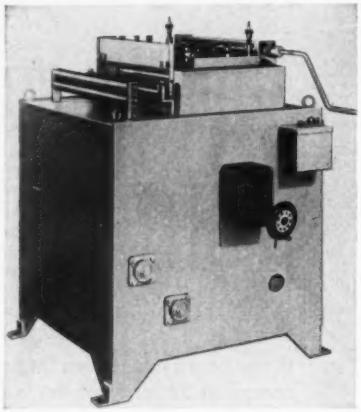


rolls and produces flat stock free of curl or camber. On standard models, the timer can be set up to produce any length up to 60 in. At 60 in., the drive clutch disengages and the timer automatically resets itself for a repeat cycle. If you add a timer bypass circuit, any length work can be fed.

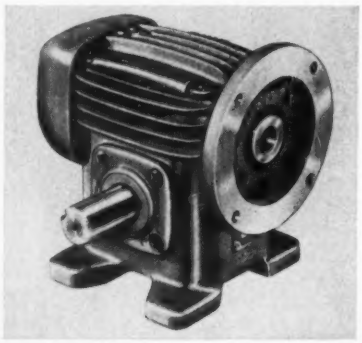
Machine sizes are obtainable to accommodate stock up to 50 in. wide and in various gages. Larger sizes can be supplied on special order.

For further information, *write* Benchmaster Mfg. Co., 1835 W. Rosecrans Ave., Gardena, Calif.

Speed Reducers Have Two Types of "C" Flanges

A LINE of fin and fan cooled speed reducers ("Hi-Line" Series) is available with two types of "C" flanges. One style permits direct connection of the motorshaft to the reducer's inputshaft. The other has a bell shaped flange which allows room for a flexible coupling between the motor and reducer inputshaft.

Standard NEMA motor frames can



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STEEL

be accommodated. The line has up to 80 per cent more capacity than comparable nonventilated types, says the company. Smaller space requirements are featured.

You can get these reducers in a range of sizes from 1.33 to 5.25 in. (center distance). Horsepower ratings range from 1/16 to 18 hp. in either flange style.

For further information, *write* Ohio Gear Co., 1333 E. 179th St., Cleveland 10, Ohio.

High Temperature Lube Has Settling Resistance

THE high temperature lubricant called Dag 207 resists settling and lubricates at temperatures where most petroleum oils carbonate, says the maker.

Typical uses are on oven conveyors, kiln cars, gears, and bearings.

The substance is a concentrated dispersion of colloidal molybdenum disulfide in an LB series Ucon lubricant.

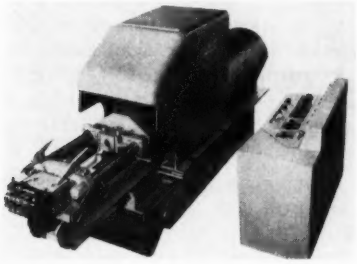
For further information, *write* Acheson Colloids Co., Port Huron, Mich.

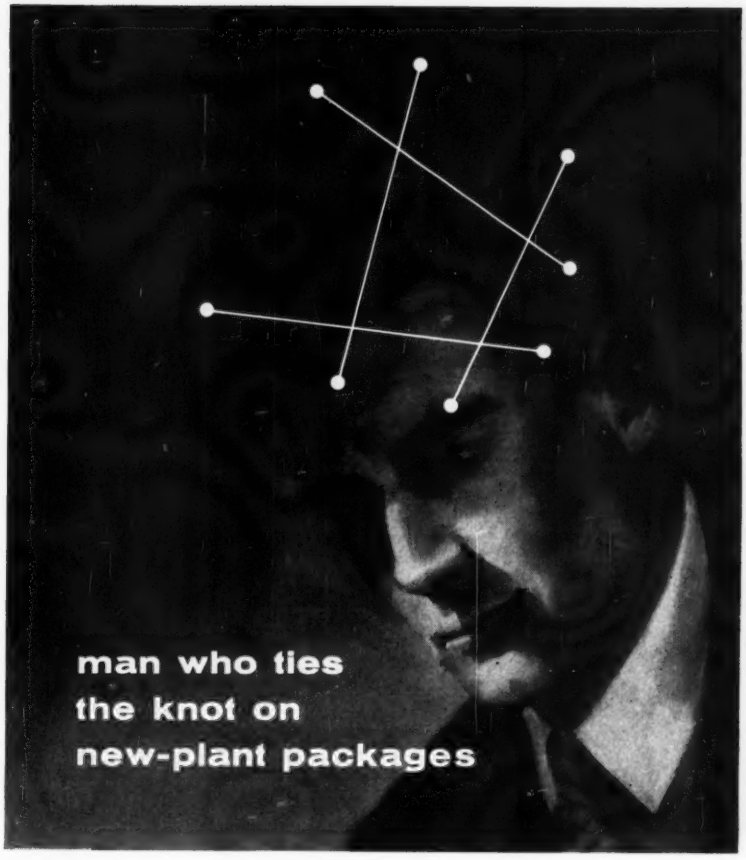
Automatic Stamper Marks Slabs, Blooms, Billets

HERE'S an automatic stamper for steel mill marking of slabs, blooms, or billets.

A remote control electronic console enables the operator to set the stamping wheels from a pulpit located away from the line.

The unit shown has been designed for stamping heat number, ingot, and cut number in ¾ in. figures. Marking depth is sufficient to





The conveyor system "wraps up" the plant as a production unit. Designing such a system is a job for a *specialist . . . a specialist called in early.*

"The Man from Logan" offers *complete* conveyor engineering service. One of the industry's most comprehensive lines of equipment enables him to meet every need with the best answer.

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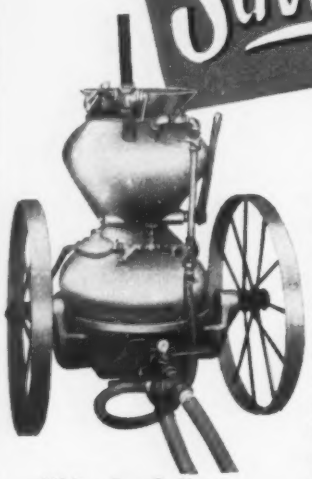

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NEW Literature

Write directly to the company for a copy

Optical Equipment Catalog

A 25 page optical tooling and industrial alignment equipment catalog covers a complete line for production tooling, machine alignment, quality control, and inspection. Keuffel & Esser Co., Adams and Third Streets, Hoboken, N. J.

Welding Wire Data

An 84 page booklet (ADC 873A) includes data on Airco's line of gas shielded, metal arcwelding wires. Air Reduction Sales Co., a division of Air Reduction Co. Inc., 150 E. 42nd St., New York 17, N. Y.

Motor Control Digest

A 162 page digest gives descriptive, pricing, technical, and engineering information on a complete line of motor controls. Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

Power Control Units

Bulletin S-1075, 8 pages, describes a line of power control units utilizing magnetic gating amplifiers driving silicon controlled rectifiers. The devices are designed for proportional or switching control. Magnetic Amplifiers Inc., 632 Tinton Ave., New York 55, N. Y.

General Catalog

Properties and uses of some 375 industrial, pharmaceutical, and agricultural chemicals currently produced are listed in a 44 page catalog (1959-60 edition). Dow Chemical Co., Midland, Mich.

Precision Ground Steels

This 16 page catalog lists over 1000 sizes of oil hardening-air hardening, low carbon, precision ground tool steels. Peninsular Steel Co., 24401 Groesbeck Highway, Detroit 5, Mich.

Tool Steel

A 12 page booklet illustrates a high carbon, high chrome, air hardening and oil hardening tool steel called Tri-Tung. Uddeholm Co. of America, 155 E. 44th St., New York.

Aluminum Technical Brochure

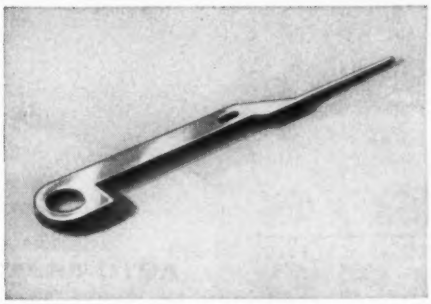
An 8 page brochure outlines the properties of Olin Aluminum alloys in pig, ingot, and billet forms. Henning Bros. & Smith Inc., 91-127 Scott Ave., Brooklyn, N. Y.

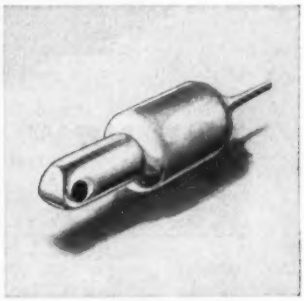
Hydraulic Press Brakes

Bulletin 91, 4 pages, gives specifications and die space dimensions for 44 models in a 200 to 1000 ton mechanical and hydraulic press brakes line. Niagara Machine & Tool Works, Buffalo 11, N. Y.

NEWS
from Torrington on
SMALL PRECISION
METAL PARTS

"Custom manufacture" need not be costly—at least, as practiced at Torrington's Specialties Division. Our engineers, experienced in a multitude of methods and operations, have a knack for fitting the most efficient techniques to any small metal part in question. And these methods are not necessarily the most obvious. The motto might well be, "Precision at any cost—so long as it's the *lowest* cost possible!"





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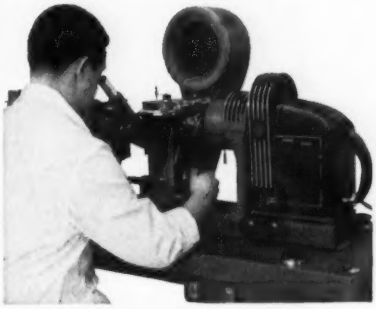
Then there's the pin we make for an aircraft application. Made of 440C stainless—a difficult material to work—it is finished to 8 micro-inches, again without grinding. The three radii are held concentric to .006". After tempering to RC 52-60, the part is given a .0002 to .0004" hard chrome plate.

Part of the perfection of the finished unit is the quality of material used. Skilled metallurgists have access to the most modern laboratory equipment to make sure materials meet your drawing specifications. We maintain three separate heat-treating departments, each with equipment selected for specific types of parts or materials involved. Statistical quality control methods insure the quality of product you specify. For help with



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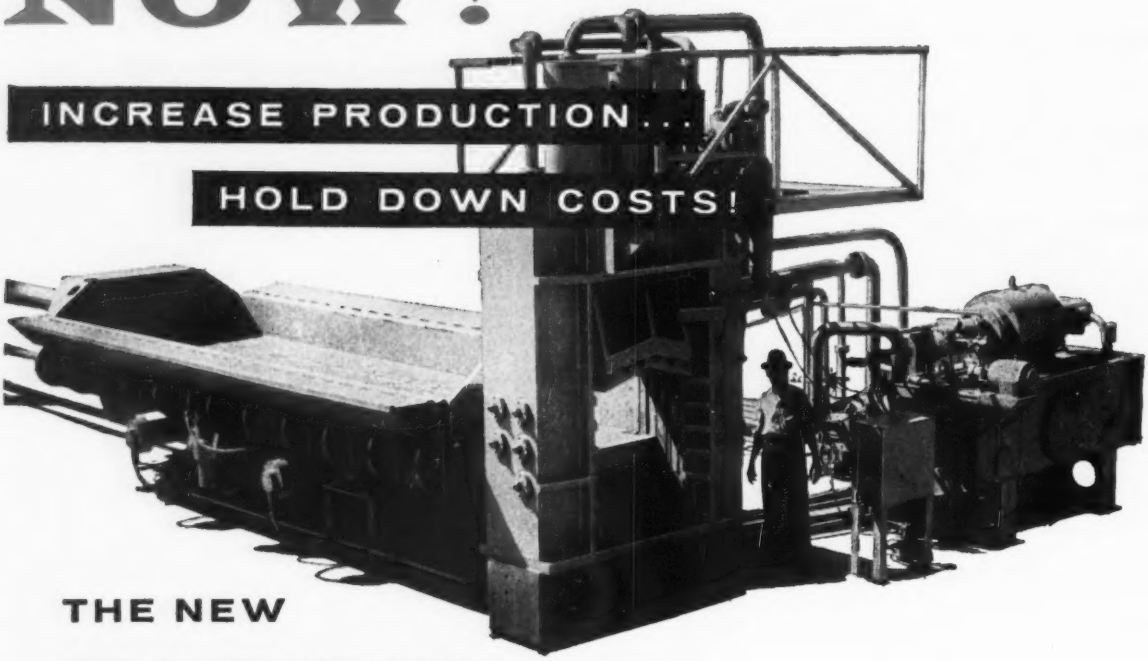

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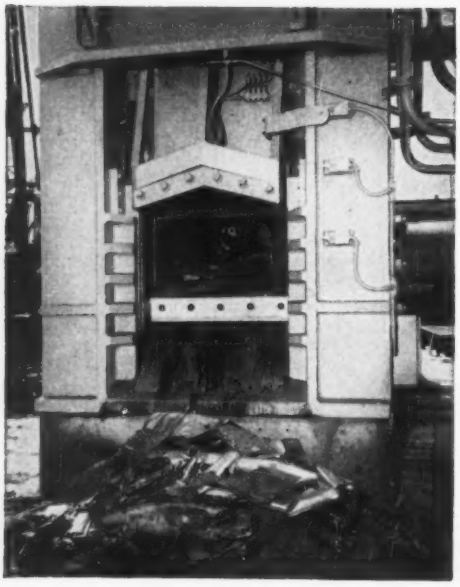
HARRIS BS-350 BALER-SHEAR

AUTO FRAMES and bulky scrap work through easily. The Harris Baler-Shear was designed to eliminate problems arising from the preparation of bulky scrap. It incorporates the principles of baling and shearing.



SPECIFICATIONS

size of charging box	264 x 83 x 41"
shear opening height	20"
shear opening width	36"
shear force	350 tons
floor space required	55' x 20'

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CORDELE, GEORGIA

Talk with a Man from Harris

Shutdowns Accelerate as Stocks Vanish

LOOK FOR a rash of layoffs in metal fabricating in the next few weeks regardless of what happens in basic steel.

The sudden return of 500,000 steelworkers to their jobs may offset employment losses in fabricating, but it won't solve the fabricators' No. 1 problem—lack of steel. Not overnight, anyway.

It will be at least a month before steelmaking operations attain 90 per cent of capacity, and four to six weeks before shipments reach a substantial volume. What's more, up to 15 per cent of the November-December tonnage will be ticketed for defense projects. (Steelmakers estimate that only 3 or 4 per cent of the tonnage they've booked is affected by government priorities, but it must all be shipped within 60 days of resumption.) Says a government official: "It will be the end of the year before any sizable tonnages go to the consumer industries."

AUTOMAKER ON SPOT— Hardest hit of the major consumers is General Motors Corp., which has laid off more than 120,000 employees. GM gambled on a shorter strike than its competitors. Now it's afraid that Chevrolet, shut down for lack of steel, will lose out to Ford in the annual sales race. Look for GM to play hard and fast in its quest for poststrike steel.

FABRICATORS STYMIED— Acute shortages of plates and structurals will force additional cutbacks in heavy construction before steelmakers resume normal shipments. In the East, leading producers are quoting four to five months delivery on popular sizes of wide flange sections, three months on standard shapes and bar size angles. At Pittsburgh, builders' inability to get 3000 tons of steel will delay ground breaking for a 20 story office building by a year.

SERVICE CENTERS BARE— Distributors in the major steel consuming centers are selling out to the bare walls. Once brimming, warehouses have been swept clean of the most wanted items—sheets, plates, and structurals. At Chicago, service centers are replacing galvanized stocks with aluminum. Because carbon bar inventories are riddled, buyers are turning to alloys. Eastern distributors expect no volume shipments from the mills until at least four weeks after steel plants get back into production. The greatest lag will be in heat treated alloy bars, they believe, because of processing requirements.

SECURITY IMPERILED— Union arguments notwithstanding, government sources say continuation of the strike would "do irreparable injury to national defense" and "cause irretrievable loss of time" in missile programs. Mills not affected by the strike can't meet all military requirements for special shapes, forms, and sizes, they argue. Another factor: Some missile manufacturers are reluctant to try steel from nonregular sources when they know the material they're accustomed to using will work in a critical spot.

INGOTS AND BILLETS SHORT— Producers of semifinished steel will have little or nothing to offer nonregular customers after the strike. They're consigning almost all of their ingots, billets, and slabs to their own mills or to buyers with long term contracts. Says one company: "We'll have no tonnage to sell to converters and no finishing mill space available for conversion."

INGOT RATE UP SLIGHTLY— Last week's steelmaking operations reflected Kaiser Steel Corp.'s settlement with the union. Nationally, operations climbed 0.4 point to 13.5 per cent of capacity. Production was about 382,000 ingot tons.

WHERE TO FIND MARKETS & PRICES

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Nonferrous Met.	134	136	Wire	114	123

*Current prices were published in the Oct. 26 issue and will appear in subsequent issues.

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has done...is doing...
and will do...many jobs better than
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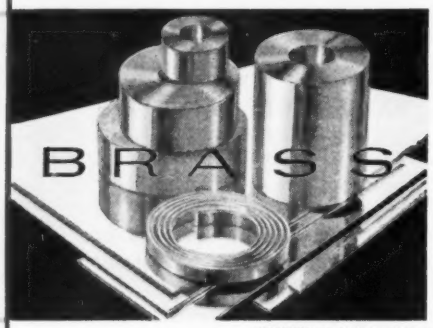

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STEEL
QUARTERLY SURVEY

MILL PRODUCTS	CURRENT INVENTORIES					1st Quarter FORECAST		
	UNDER 10 DAYS	10-30 DAYS	30-60 DAYS	60-90 DAYS	3-6 MONTHS	LOWER	SAME	HIGHER
HOT-ROLLED CARBON BARS	51%	40%	4%	4%	1%	37%	22%	41%
COLD-FINISHED BARS	28%	36%	25%	8%	3%	45%	30%	25%
H & C-R SHEETS, STRIP	35%	43%	14%	6%	2%	40%	32%	28%
LIGHT PLATES	48%	31%	15%	5%	1%	49%	19%	32%
HEAVY PLATES	40%	33%	19%	6%	2%	51%	20%	29%
STRUCTURAL SHAPES	50%	39%	5%	4%	2%	44%	25%	31%
COPPER & BRASS	26%	44%	13%	12%	5%	32%	47%	21%
ALUMINUM	3%	17%	49%	20%	11%	30%	52%	18%

FIGURES are percentages of respondents to STEEL's quarterly survey.
COLOR UNDERSCORED figures show how most respondents reported.

Steel Running Out; Drought Ahead

Nearly 80 per cent of STEEL's respondents will be forced to curtail operations in November. Outlook: Continuing scarcities and allocation through the first half

THE HONEYMOON is over. Even the outstanding stockpiling job done before plants were closed couldn't prevent stock depletion to dangerously low levels as a result of the longest steel strike in U. S. history. The spot shortages of several weeks ago have distended into gaping holes. Ferrous stocks of 42 per cent of STEEL's respondents are sufficient for less than 10 days. About 37 per cent are at 10 to 30 day levels. Only 21 per cent have reserves for more than 30 days. All ferrous categories of 30 days and over are down sharply from the last survey (STEEL, Aug. 3, p. 103).

Even with mills in full production, many would find themselves in extremely serious straits. Those with apparently good inventories on paper report imbalances have forced cutbacks and threaten over-all operation. Shutdowns have begun in many areas.

• **Delivery Problems Rampant** — Over 60 per cent of the respondents mentioned delivery troubles. Difficulties with "all steel products" are being experienced by 17 per cent. Supply of sheets is most critical. Such shortages were noted by 22 per cent of the buyers. Structurals, plates, strip, and bars were frequently mentioned, in that order. Overstocks, mostly aluminum products, were reported by 4 per cent.

• **Outlook Bleak**—The first quarter inventory outlook is far from cheery. About 41 per cent see inventory levels plummeting farther since incoming metal will be going out as fast as it can be fabricated. Some 30 per cent believe reserves will be at current levels next April, while 29 per cent expect an upturn at that time. Most optimistic are purchasers of hot rolled carbon bars. Reason: Hot rolled bars will be one of the first items to roll off revitalized production lines.

The consensus suggests it will be at least three to six months before inventories reach desired levels. Taft-Hartley cannot be expected to improve the situation appreciably. If invoked to reopen mills, it will be a minimum of two weeks before significant finished steel shipments are made. To operate at near capacity rates will take longer. And many open hearths need extensive repairs after standing idle so long.

Orders are already extended up to

six months on some items. Several mills have announced their output will be "on allocation." Others have stated only regular customers are to be considered at first. So the effects of the strike will not only be felt next quarter, but through most of 1960.

• **Some Imports Help** — About 14 per cent of the purchasing agents have attempted to ease the bind with some foreign steel. Others indicate such a move is in the offing. Another 8 per cent are attempting to maintain their stocks with gray market steel.

• **Copper**—Copper and brass buyers are having nearly as much trouble as ferrous purchasers. Stocks are becoming depleted as a result of the copper strike.

The long term copper-brass outlook appears somewhat better than that for steel goods. Nearly 47 per cent expect little change by the end of the first quarter; 21 per cent anticipate an upturn; 32 per cent foresee a continuing decline.

• **Aluminum** — Aluminum buyers are in good shape. They had stockpiled for a strike. But the contracts have been extended until after a steel settlement. Purchasing agents apparently feel a peaceful settlement in aluminum is more likely now than it was earlier in the year. There has been a sharp rise in reserves in the 10 to 30 day group and a fall in the 60 to 90 day category. Other classifications remained about the same. Over half of the respondents expect stocks to be at present levels on Apr. 1. About 30 per cent see a decline, while 18 per cent predict an upturn.

YOU CAN DEPEND ON

SUPERIOR LADLE BRICK

TO ✓ Cut down-time
✓ Lower per ton cost
✓ Increase melting capacity

SERVING THE STEEL INDUSTRY SINCE 1873 ★

The GLOBE BRICK Co.
EAST LIVERPOOL, OHIO

Sheets, Strip . . .

Sheet & Strip Prices, Pages 122 & 123

Cutbacks in manufacturing operations are accelerating, and regardless how soon the steel mills get back into production, this trend is likely to continue for a while as it will take a month or more for sheet shipments to attain heavy volume.

The scarcity of supplies will intensify the pressure for deliveries and will make for further dislocation of consumer schedules, possibly resulting in some sheet order deferements and even cancellations. Also, a shift may come in consumer requirements and changes may be made in the pattern of end-use buying before the national economy becomes stabilized.

Sheets are hardest to get. Distributors have long been cleaned out of hot and cold rolled and galvanized sheets. At the same time, the leading mills can't accept any new tonnage orders for delivery under five or six months—taking into account government set-asides. They can enter orders for later delivery, but are disinclined to do so until they know where they stand.

Because furnace repairs will be the first order of business when the strikers return to their jobs, a Pittsburgh sheetmaker will need more than 60 days to get back to full production. This producer won't buy ingots from other companies because of the high cost. Booked five months ahead, the mill is not accepting any new business now.

Officials of another company are warning customers they're likely to get less steel than they expect.

"We'll have to discount orders by whatever percentage our operations fall short of expectations," an executive explains.

Although it hasn't opened its books for fourth quarter (1959) or first quarter (1960), another Pittsburgh sheetmaker says: "Our salesmen are not soliciting orders, but if regular customers send in orders of reasonable size, we're not insisting they be returned. We acknowledge receipt, explain we're holding them at our district offices, and make no delivery promises."

Foreign Steel Cushions Strike's Impact in Texas

Foreign steel continues to move into Texas ports to cushion the impact of the strike on supply. There have been few critical shortages in the area.

September imports amounted to 60,792 tons vs. 51,678 in August and 84,656 in July. A wide range of products arrived from Belgium, France, Italy, Japan, and South Africa during the month. Belgian shipments alone totaled nearly 31,000 tons.

Included in the September total: 12,442 tons of reinforcing bars; 7700 tons of structurals; 7813 tons of wire rods; 8200 tons of pipe; 1186 tons of wire; 828 tons of nails.

Tin Plate . . .

Tin Plate Prices, Page 123

Milk canners in California are worried about supplies of tin plate. The California Milk Producers Federation wants a priority for the distribution of present tin plate stocks among evaporated milk manufacturers. A crisis is foreseen even if steelworkers return to work immediately.

Continental Can Co. has broken ground for a $1.5 million plant in Merced, northern California. It is expected to be in operation May 1 and will have initial annual capacity of 100 million cans.

Steel Bars . . .

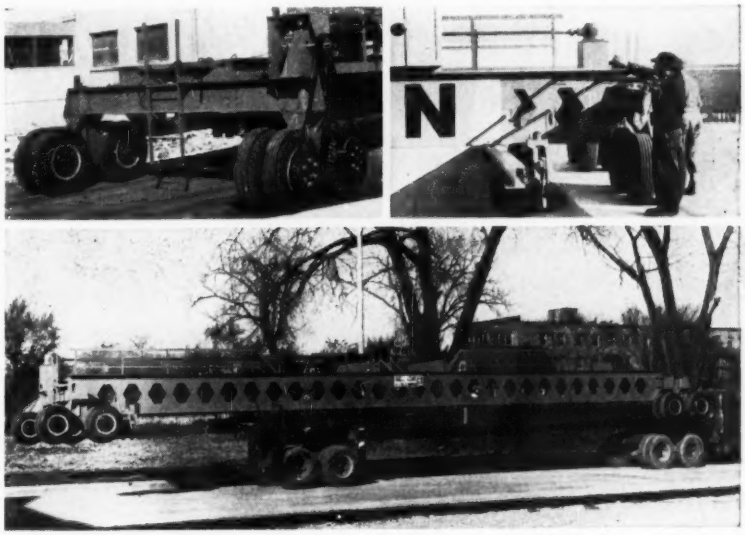
Bar Prices, Page 121

When steel furnaces are again tapped, producers of hot rolled bars will give defense orders top priority. Chances are good that "automatic" military set-asides will more than cover government requirements—estimated by some companies at no more than 2 or 3 per cent of total bookings. Once the defense tonnage has been shipped, the bar mills will start processing August and earlier orders that were booked prior to the strike.

That means most of them can accept little new tonnage for delivery under five months after resumption of production. As for existing orders on book, it's not likely they'll be able to get out much tonnage under two or three weeks at earliest.

Steel service centers can still help out on some of the larger bar sizes, but they have little tonnage in the smaller sizes. Over-all, supplies of hot bars will get tighter before conditions improve and it will also be touch-and-go on the cold drawn carbon grades and alloys for several weeks after operations are restarted.

General Motors Corp., fearful that lack of steel may handicap its Chevrolet Div. in the sales race



ABELL-HOWE CUTS THE HIGH COST OF SPECIAL CRANES FOR SPECIAL SERVICE

Here's a one-of-a-kind crane built by Abell-Howe for George D. Hardin, Inc., Chicago contractor, who constructed a big water filtration plant on the windy city's north side. Rated at 15 tons capacity, the heavy duty rubber-tired crane loads, lifts and spreads sand and gravel and also positions heavy precast concrete water troughs. This, of course, is only one of the many kinds of special cranes Abell-Howe builds for special jobs. Even Uncle Sam enlists Abell-Howe to build special cranes for defense installations.

All of this experience in meeting individual crane problems is yours to benefit from. No matter what your particular crane need may be, Abell-Howe can build it for you best—and save you money in the process.

ASK FOR YOUR ABELL-HOWE CRANE BROCHURE

ABELL-HOWE COMPANY
7757 WEST VAN BUREN STREET, FOREST PARK, ILLINOIS

with Ford, is expected to press for heavy shipments. GM outguessed itself on inventory policy. Gambling on a short strike, it bought too little.

While it's rumored in some quarters that steelmakers will divert semifinished material from the bar mills to sheets, there's no evidence to support belief in such policy. Order backlogs are so large that the bar producers won't have surplus capacity before July. If solicitation objectives are reduced, big users will get no more than their proportionate share. Hardship cases may be given special consideration.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 122

Heavy buying of concrete reinforcing steel bars has subsided. Bridge and heavy construction orders will be lighter over the rest of this year with estimating on the decline seasonally. Bar inventories are low, but the distribution of orders is uneven. Imports are providing strong competition at some points, notably in New England.

Two small bar plants in the Pacific Northwest are operating. Both have fair order backlogs. Last week's bar awards included 1500 tons to James D. English Steel Co., Tacoma, Wash., for the St. Regis paper mill in that city.

Wire . . .

Wire Prices, Pages 123 & 124

Wiremakers are offering two to three months' delivery on manufacturers' wire and wire rods after steelworkers return. However, only two to three weeks (even less in some instances) will be required to get deliveries of merchant wire items. Foreign steel continues to provide stiff competition for the domestic mills.

The U. S. Engineer, Chicago, closes bids Nov. 16 on 5000 coils (about 310 tons) of steel wire.

Tubular Goods . . .

Tubular Goods Prices, Page 125

Oil country inventories of tubing, casing, and drill pipe are thought to be adequate for the next 30 to 60 days. Producers say orders for the first quarter are "stuttering" in, and warn that users had better place tonnage on mill books immediately if they expect to get first quarter delivery.

Following an active summer, cast iron pipe sales agencies report demand is tapering seasonally. Some small orders are still being booked, and little new business is expected until municipalities begin to show interest in requirements for 1960 programs.

Oil drilling declined in the week ended Oct. 19 for the second week in succession, reports Hughes Tool Co. During the week, 2028 rotary rigs were in operation, down 14 from the preceding week, but 10 more than in the comparable week a year ago.

The only mill operating in Texas is unable to fill a flood of orders for tubular goods coming from small, independent petroleum firms, although it is running at capacity. The pipe mill, with about 600,000 tons annual capacity (depending on the size of pipe produced), is in full production.

Some of the requests for pipe are from companies the mill has not done business with on a regular customer basis. Major oil companies

New Invention Picks Up 40 Cu. Yd. Detachable Containers . . . 15-Ton Loads

Dinosaur picks up in excess of 30,000 pounds of granular material, white line inside container indicates load has not shifted.

DEMPSTER-DINOSAUR Handles Containerized Cargo, Waste and Raw Materials . . .

The newly developed DEMPSTER-DINOSAUR is a system of materials handling that employs giant containers up to 40 cubic yards and larger. It lends itself to any situation where bulk accumulations of raw materials, liquids, waste or finished products must be handled. Since one truck and one driver can automatically pick up, haul and dump or set down a number of containers, the DINOSAUR easily does the work of several trucks.

Container is shown locked into carrying position.

Two models are available — one for tandem trucks, handles 30,000 pounds; the other, for single axle trucks, handles 22,000 pounds. Special off-the-road models are available for loads limited only by the capacity of the truck.

Free Booklet Offered

A free booklet which describes the operation of this new system in detail is offered by the manufacturer.

Mfd. By Patents Pending

DEMPSTER BROTHERS, Inc.

Dept. S-1A, Knoxville 17, Tenn.

did a good prestrike stockpiling job, but the smaller operators were unable to amass much tonnage.

Some steelmaking capacity is available for producing slabs for Chrysler Corp. Initial shipments to Chrysler went out late in September.

Plates . . .

Plate Prices. Page 121

Producers of sheared plates whose plants have been strikebound are not overly optimistic regarding shipments against new orders after operations are resumed. Some mills still think they can deliver tonnage within three months, but others feel it will take them four months or longer.

As for actual shipment tonnage against old orders, not even fairly good volume will be approached for at least a month. Much will depend upon the condition of facilities, including electrical equipment, such as crane motors.

Due to heavy pressure for sheet and strip, little strip plate will be available for several weeks after operations are resumed.

Several sizable jobs involving plates are on drawing boards, but calls for bids on many of these will probably be delayed until the steel supply outlook has been clarified. New contracts are being accepted by fabricators with performance subject to steel availability.

New England Buyers Face Higher Pig Iron Costs

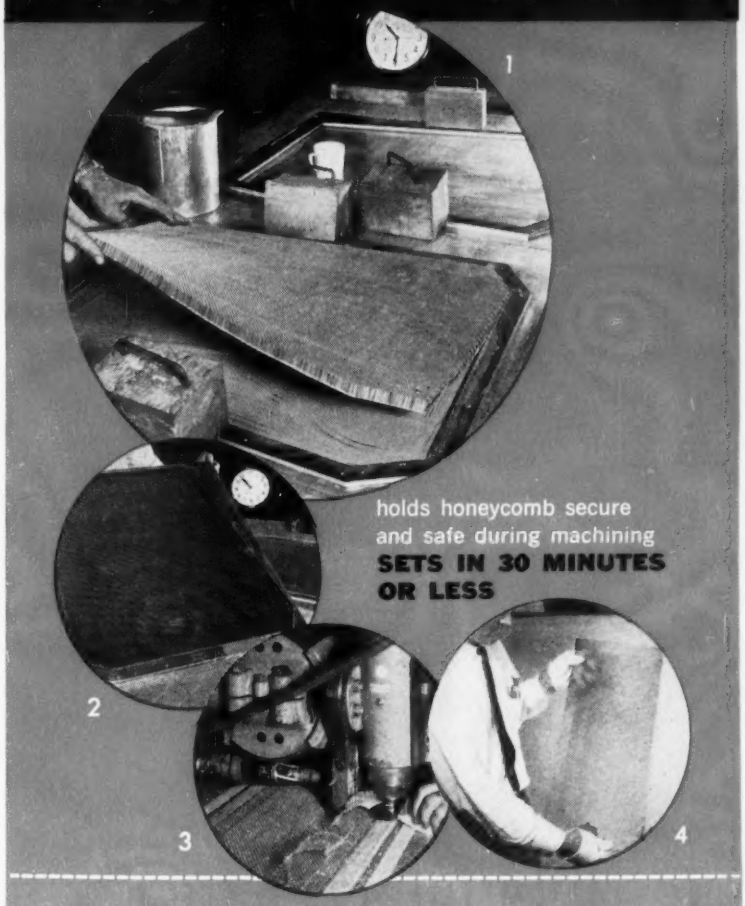
Most New England pig iron buyers face higher costs because the Mystic Iron Works furnace at Everett, Mass., has been permanently closed by Eastern Gas & Fuel Associates (STEEL, Oct. 26, p. 237). Reason: Higher freight rates from Buffalo, Troy, N. Y., and Swedeland, Pa.

While the price of No. 2 foundry iron is $66.50 f.o.b. furnace at those points compared with $68, Everett, transportation charges will increase delivered costs for most buyers.

The Mystic furnace has around 35,000 tons of iron in stockpile, mostly foundry grades. It will be sold to contract-customers at current prices.

The stack has a rated capacity

Zincilate WST-200



Zincilate WST-200 sets in 30 minutes or less, "locking" the honeycomb section securely and safely in position for machining. In 15 minutes or less, every trace of WST-200 is rinsed away in a simple hot water dip, leaving the honeycomb spotlessly clean, ready for perfect brazing.

Zincilate WST-200, honeycomb hold-down coating, is one of several specialized coatings developed exclusively by Industrial Metal Protectives, Inc. For complete information, write, outlining your requirements for hold-down, corrosion-resistant, scratch-resistant, permanent or temporary coatings. If desired, samples and engineering assistance can be provided.

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means automatic cycling of blooming mills

. . completely coordinated positioning of horizontal rolls and manipulators . . . automatic operation of the fingers . . . properly sequenced operation of the tables and feed rolls . . . precisely controlled timing of the start, stop, reverse and run of the main drive. This is but one of the many ways Westinghouse PRODAC† is helping bring about "the mill of the future" today through completely automatic cycling of blooming mills.

Westinghouse has service-proven PRODAC installations that economically automate slabbing mills, ingot buggy operations, reversing roughers, stock house materials handling and many other mill applications.

By specifying Westinghouse PRODAC for your mill, you open the door to many new cost-saving benefits which are unobtainable with conventional controls. For example, PRODAC assures the most consistent standards of quality control at the highest rates of production speed . . . coordinates operation of all machines at the over-all maximum efficiency . . . holds maintenance to a minimum and practically eliminates control failures . . . gives you a "building block" design which provides flexibility required for further mill automation.

The entire team of Westinghouse PRODAC engineers is at your service to help you determine exactly where and how PRODAC can benefit you. Your Westinghouse sales engineer can give you complete information, or write to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-22112

†Trade-Mark

*PROGRAMMED DIGITAL AUTOMATIC CONTROL

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of 500 tons daily and has been a producer since 1926. It employed about 100. In shutting down the furnace, the company said: "The New England market for pig iron has been constantly shrinking and will no longer support continued operation of the furnace."

Pig Iron . . .

Pig Iron Prices, Page 126

Operations of foundries serving the automotive industry are threatened by the curtailment of auto production caused by the steel shortage. If auto cutbacks continue, foundries making castings for that industry will have to curtail their operations. That would result in reduced demand for merchant iron.

As effects of the steel strike spread, some other industries which use castings will be hurt. Merchant iron suppliers are increasingly concerned that a serious dislocation of pig iron sales and shipments may develop this quarter.

Supplies are ample and no scarcity is anticipated. The Everett, Mass., furnace which is going out of business has large stocks of iron on hand, including a moderately good inventory in the Philadelphia district.

Phoenix Steel Corp. expects to put its blast furnace at Chester, Pa., back in production this month. It has not been operated for several months. How much, if any, of that production will go to the merchant trade can't be determined now.

Wisconsin Steel Div., International Harvester Co., relighted its No. 1 blast furnace at South Chicago, Ill., Oct. 15. The furnace had been idle since Apr. 15. Demand for foundry pig iron in that area continues good. Stocks of iron from blast furnaces operating in the Chicago district have been depleted.

Dominion Foundries & Steel Ltd., Hamilton, Ont., will build a third blast furnace for operation late in 1960. It will increase the company's pig iron capacity about 50 per cent. Additional dock and storage facilities for iron ore and coal will be provided. The company's expansion plans will cost about $20 million, including installation of a second continuous galvanizing line, which also will be set up for the production of aluminum coated sheets.

Semifinished Steel . . .

Semifinished Prices, Page 121

Sellers of semifinished steel will have little tonnage to offer nonregular customers for some time after the mills start producing again. That's because they'll consign most of their ingots, billets, and slabs to their own finishing mills, or to buyers with whom they have long term contracts.

"We'll have no tonnage to sell to converters, and will have no finishing mill space available for conversion," one Pittsburgh area producer said last week, and that just about describes the position of other integrated steelmakers.

Iron Ore . . .

Iron Ore Prices, Page 127

The largest American ore carrier on the Great Lakes, the 730 ft *Arthur B. Homer,* will be launched Nov. 7 at the River Rouge shipyard of the Great Lakes Engineering Works near Detroit.

The vessel (owned by Bethlehem Steel Co., Bethlehem, Pa.) is expected to go into service next year. It will be able to navigate the St. Lawrence Seaway and part of the Gulf of St. Lawrence. Trip capacity will be 25,000 tons of ore when loaded to full draft of 26 ft 8.25 in. —capacity operation won't be possible until the connecting channels in the Great Lakes system are deepened to 27 ft.

The carrier can deliver 850,000 tons of ore in one navigation season. It has a beam of 75 ft and weighs 26,400 long tons. Powered by steam turbine, it is oil burning.

Item Shortage Slows Warehouse Stock Drain

The drain on steel service centers' stocks of finished steel has slowed down somewhat the last couple of weeks, reports the American Steel Warehouse Association, not because consuming demand has been satisfied, but rather because of unbalanced supplies and item shortages. The latest figures place total distributor stocks at 1.6 million tons, off more than 40 per cent

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from the start of the strike. However, the inventory is badly unbalanced, a substantial portion of the tonnage being made up of odds and ends.

For the first several weeks after the steel strike started last July, the distributors' inventories held steady as they were taking in shipments in transit when the work stoppage began, says Robert G. Welch, executive vice president of the association. After that, sales picked up gradually until they reached a point where inventories were declining at a rate of 200,000 tons weekly. That rate held until about four weeks ago, when sales fell and inventories declined at a rate of 175,000 tons for two weeks, because of item shortages.

Latest data show inventories are declining at a rate of 150,000 tons weekly, but service center sales top that figure because of foreign steel receipts and tonnage coming in from domestic mills unaffected by the strike.

Distributors . . .

Prices, Page 126

Stocks of steel at service centers are shrinking rapidly. Sheets and light gage plates have practically disappeared. Structural shapes are low while big holes have appeared in hot rolled carbon bar inventories. Alloy bars are more plentiful and are being used as a substitute for carbon grades.

Distributors expect to receive only small shipments from mills for at least four weeks after operations are resumed at struck plants. They believe the greatest lag will be in heat treated alloy bars, because of the processing involved.

Distributors have combed their market areas thoroughly for steel held by fabricators who can't use the material immediately because it is not of proper size and specification, or because it is immobilized due to lack of other components needed in the production line. Most of this type of material has been acquired by service centers and resold to customers.

Substitution of material is growing. For example, some galvanized demand is being met by aluminum, especially for ductwork. Many service centers have acquired stocks.

Depots maintained in the Southwest by foreign steelmills are taking a big slice of business in that area. One distributor in Houston cites the example of a metal building firm which sought a large tonnage of 7 in. channels. He found what he needed (100 tons) at a foreign mill depot.

Ziegler Steel Service Corp., Oakland, Calif., plans to open a service center in Honolulu shortly after the first of the year. Stocks will include steel, aluminum, and copper.

Structural Shapes . . .

Structural Shape Prices, Page 121

Structural steel bookings in September of 284,114 tons were 87,000 tons over bookings the preceding month, and an 11 per cent over bookings in the same month a year ago, reports the American Institute of Steel Construction.

Accumulated bookings during the first nine months of this year totaled 2,352,483 tons, 13 per cent greater than in the like 1958 period.

September shipments amounted to 182,596 tons, down from 220,420 tons in the preceding month. Shipments during the first nine months were 2,292,636 tons vs. 2,819,479 in the same period last year.

The order backlog as of Sept. 30 was 1,870,763 tons, with 1,092,611 tons scheduled for fabrication during the four months ending Jan. 31, 1960.

Demand for structurals is lagging. Numerous inquiries are being held up pending clarification of the steel supply outlook. Many jobs that were started are being halted because of shortages of steel which have caused cutbacks in fabricating shop schedules. Also, strikes at additional independent structural shops are hurting.

Further cutbacks in structural fabrication will be experienced before the shape and plate mills get their deliveries back to normal. Leading producers are quoting four to five months' delivery after resumption of production on the popular sizes of wide flange sections, and two to three months' delivery on standard shapes and bar size angles.

The steel shortage is particularly severe in wide flange sections. Fabricators over the nation are being pinched, noticeably shops at

(*Please turn to Page* 129)

DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

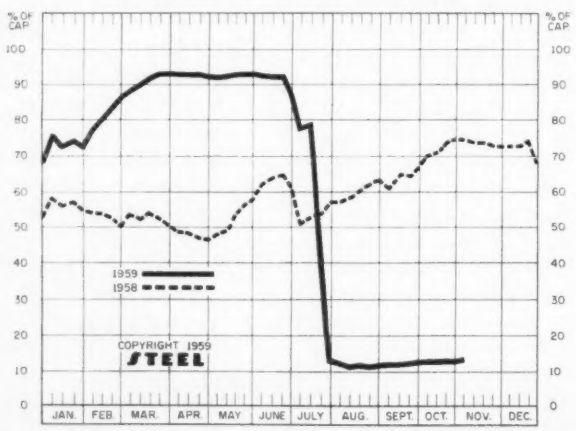
	Week Ended Nov. 1	Change	Same Week 1958	Same Week 1957
Pittsburgh	2	0	69.5	81
Chicago	5.5	— 0.5*	85	81.5
Eastern	13	0	72	82
Youngstown	9	0	64	66
Wheeling	56.5	0	83	67
Cleveland	6	0	80	91.5
Buffalo	4	0	78	90
Birmingham	9	0	63.5	69
Cincinnati	67.5	— 3*	83	87
St. Louis	65.5	+ 1	90.5	92.5
Detroit	23.5	+ 0.5*	84	98
Western	6.5	+ 0.5	75	91
National Rate	13.5	+ 0.4*	75	79

INGOT PRODUCTION

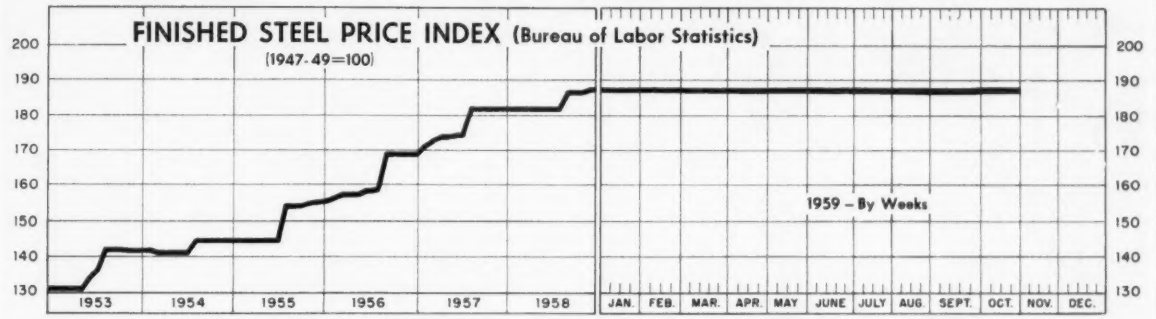
	Week Ended Nov. 1	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	23.8†	23.1	22.5	126.0
NET TONS (In thousands)	382†	371	362	2,024

*Change from preceding week's revised rate.
†Estimated by STEEL; comparative figures reported by AISI.
Weekly capacity (net tons): 2,831,331 in 1959; 2,699,173 in 1958; 2,559,490 in 1957.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



Oct. 27, 1959	Week Ago	Month Ago	Oct. Index	Year Ago
186.8	186.8	186.8	186.8	186.2

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Oct. 27

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.825
Rails, Light, 40 lb	7.292
Tie Plates	6.875
Axles, Railway	10.175
Wheels, Freight Car, 33 in. (per wheel)	62.000
Plates, Carbon	6.350
Structural Shapes	6.167
Bars, Tool Steel, Carbon (lb)	0.560
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.680
Bars, Tool Steel, H.R. Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400
Bars, Tool Steel, H.R. Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.895
Bars, H.R., Alloy	10.775
Bars, H.R., Stainless, 303 (lb)	0.543
Bars, H.R., Carbon	6.675
Bars, Reinforcing	6.385
Bars, C.F., Carbon	10.710
Bars, C.F., Alloy	14.125
Bars, C.F., Stainless, 302 (lb)	0.570
Sheets, H.R., Carbon	6.350
Sheets, C.R., Carbon	7.300
Sheets, Galvanized	8.735
Sheets, C.R., Stainless, 302 (lb)	0.658
Sheets, Electrical	12.625
Strip, C.R., Carbon	9.489
Strip, C.R., Stainless, 430 (lb)	0.480
Strip, H.R., Carbon	6.250
Pipe, Black, Buttweld (100 ft)	19.905
Pipe, Galv., Buttweld (100 ft)	23.420
Pipe, Line (100 ft)	199.533
Casing, Oil Well, Carbon (100 ft)	201.080
Casing, Oil Well, Alloy (100 ft)	315.213
Tubes, Boiler (100 ft)	51.200
Tubing, Mechanical, Carbon (100 ft)	27.005
Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	10.100
Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.800
Black Plate, Canmaking Quality (95 lb base box)	7.900
Wire, Drawn, Carbon	10.575
Wire, Drawn, Stainless, 430 (lb)	0.665
Bale Ties (bundles)	7.967
Nails, Wire, 8d Common	9.825
Wire, Barbed (80-rod spool)	8.742
Woven Wire Fence (20-rod roll)	21.765

STEEL's FINISHED STEEL PRICE INDEX*

	Oct. 28 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	247.82	247.82	247.82	246.65	194.53
Index in cents per lb	6.713	6.713	6.713	6.682	5.270

STEEL's ARITHMETICAL COMPOSITES*

Finished Steel, NT	$149.96	$149.96	$149.96	$149.28	$117.95
No. 2 Fdry, Pig Iron, GT	66.49	66.49	66.49	66.49	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	57.27
Steelmaking Scrap, GT	44.33	44.33	43.00	42.00	32.67

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Oct. 28 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.675	4.30
Bars, H.R., Chicago	5.675	5.675	5.675	5.675	4.30
Bars, H.R., deld., Philadelphia	5.975	5.975	5.975	5.975	4.55
Bars, C.R., Pittsburgh	7.65*	7.65*	7.65*	7.65*	5.40
Shapes, Std., Pittsburgh	5.50	5.50	5.50	5.50	4.25
Shapes, Std., Chicago	5.50	5.50	5.50	5.50	4.25
Shapes, deld. Philadelphia	5.77	5.77	5.77	5.77	4.53
Plates, Pittsburgh	5.30	5.30	5.30	5.30	4.225
Plates, Chicago	5.30	5.30	5.30	5.30	4.225
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.30	4.225
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.30	4.225
Plates, Claymont, Del.	5.30	5.30	5.30	5.30	4.225
Sheets, H.R., Pittsburgh	5.10	5.10	5.10	5.10	4.05
Sheets, H.R., Chicago	5.10	5.10	5.10	5.10	4.05
Sheets, C.R., Pittsburgh	6.275	6.275	6.275	6.275	4.95
Sheets, C.R., Chicago	6.275	6.275	6.275	6.275	4.95
Sheets, C.R., Detroit	6.275	6.275	6.275	6.275	5.10
Sheets, Galv., Pittsburgh	6.875	6.875	6.875	6.875	5.45
Strip, H.R., Pittsburgh	5.10	5.10	5.10	5.10	4.05
Strip, H.R., Chicago	5.10	5.10	5.10	5.10	4.05
Strip, C.R., Pittsburgh	7.425	7.425	7.425	7.425	5.75
Strip, C.R., Chicago	7.425	7.425	7.425	7.425	6.00
Strip, C.R., Detroit	7.425	7.425	7.425	7.425	5.60-5.90
Wire, Basic, Pittsburgh	8.00	8.00	8.00	8.00	5.75
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	6.85
Tin plate (1.50 lb) box, Pitts.	$10.65	$10.65	$10.65	$10.30	$9.05

*Including 0.35c for special quality.

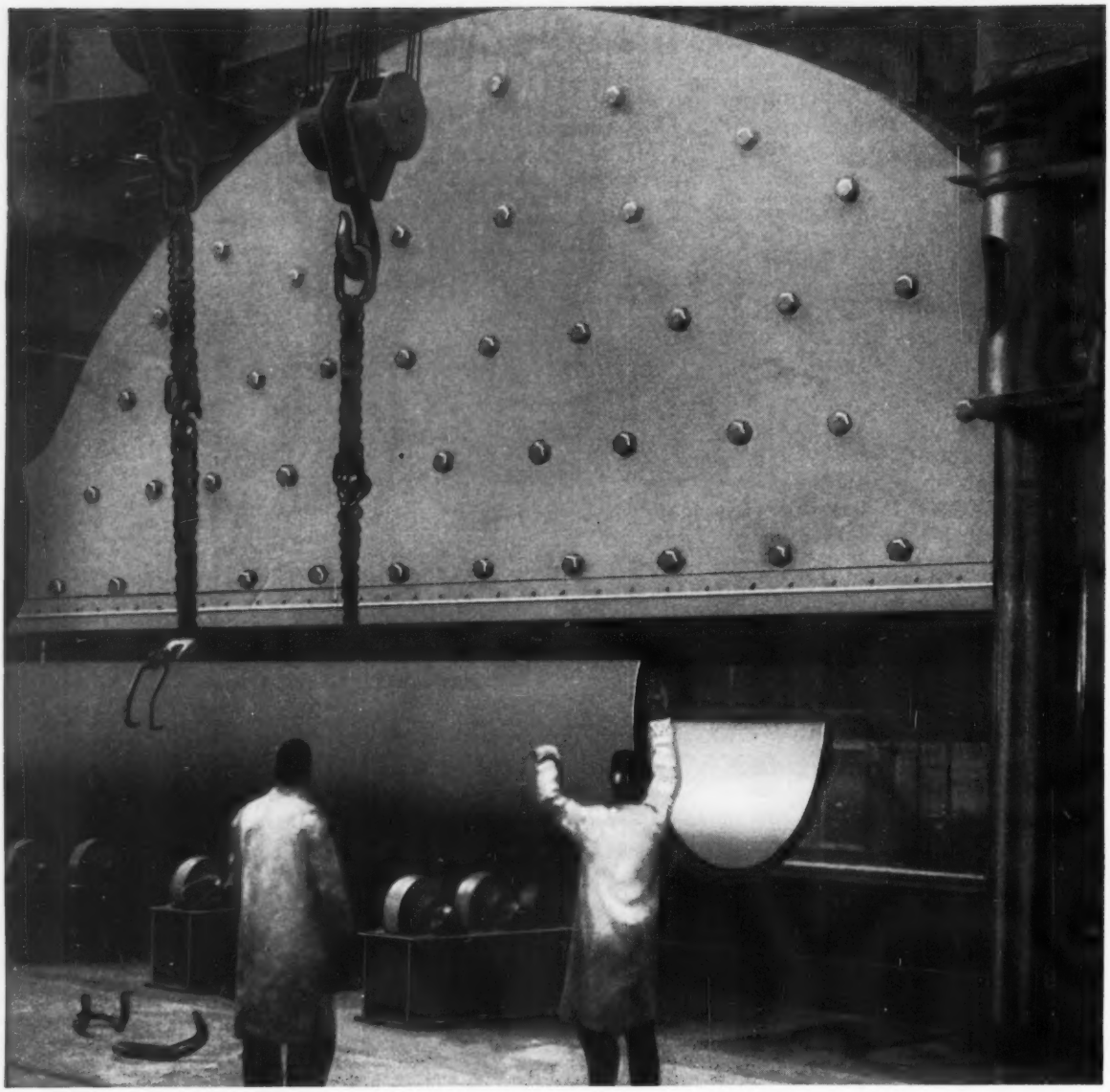
SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$99.50	$78.00
Wire rods $\frac{7}{32}$-$\frac{9}{16}$" Pitts.	6.40	6.40	6.40	6.40	4.675

PIG IRON, Gross Ton	Oct. 28 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pittsburgh	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	66.00	56.00
Basic, deld., Philadelphia	70.41	70.41	70.41	70.41	59.66
No. 2 Fdry, Neville Island, Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.91	50.16
No. 2 Fdry, Birmingham	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry (Birm.) deld., Cin.	70.20	70.20	70.20	70.20	60.58
Malleable, Valley	66.50	66.50	66.50	66.50	56.50
Malleable, Chicago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net ton†	245.00	245.00	245.00	245.00	190.00

†74-76% Mn, Duquesne, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$44.50	$44.50	$44.50	$43.50	$32.50
No. 1 Heavy Melt, E. Pa.	45.00	45.00	44.00	40.00	32.50
No. 1 Heavy Melt, Chicago	43.50	43.50	40.50	42.50	33.00
No. 1 Heavy Melt, Valley	44.50	44.50	43.50	43.50	35.00
No. 1 Heavy Melt, Cleve.	41.50	41.50	40.50	40.00	32.50
No. 1 Heavy Melt, Buffalo	33.50	33.50	33.50	35.50	30.50
Rails, Rerolling, Chicago	64.50	64.50	62.50	62.00	54.50
No. 1 Cast, Chicago	57.50	57.50	56.50	45.50	39.50

COKE, Net Ton					
Beehive, Furn., Connlsvl.	$15.00	$15.00	$15.00	$15.25	$13.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.25	16.75
Oven, Fdry., Milwaukee	32.00	32.00	32.00	30.50	25.25



IF FORMING HEAVY PLATE IS YOUR PROBLEM, consider the dimensions of work handled by Foster Wheeler. Steel plates up to 9″ thick or up to 40′ long can be formed on Foster Wheeler's 8000-ton beam press. Plates 2″ thick or less can be formed to a minimum of 8½″ ID.

Our facilities permit fabrication of pressure vessels, drums or cylinders up to 12′ in diameter, 100′ long, weighing up to 200 tons. Also available: mechanical design and drafting; complete machining, welding, stress relieving and x-ray services; and any special inspection and quality control procedures you may require.

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NEW YORK LONDON PARIS ST. CATHARINES, ONT.

Steel Prices

Mill prices as reported to STEEL, Oct. 28, cents per pound except as otherwise noted. *Changes shown in italics.* Code number following mill point indicates producing company. Key to producers, page 122; footnotes, page 124.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 ....$76.00

INGOTS, Alloy (NT)
Detroit S41 ....$82.00
Economy,Pa. B14 ....82.00
Farrell,Pa. S3 ....82.00
Lowellville,O. S3 ....82.00
Midland,Pa. C18 ....82.00
Munhall,Pa. U5 ....82.00
Sharon,Pa. S3 ....82.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)
Bartonville,Ill. K4 ...$82.00
Bessemer,Pa. U5 ....80.00
Buffalo R2 ....80.00
Clairton,Pa. U5 ....80.00
Ensley,Ala. T2 ....80.00
Fairfield,Ala. T2 ....80.00
Fontana,Calif. K1 ....90.50
Gary,Ind. U5 ....80.00
Johnstown,Pa. B2 ....80.00
Lackawanna,N.Y. B2..80.00
Munhall,Pa. U5 ....80.00
Owensboro,Ky. G8 ....80.00
S.Chicago,Ill. R2, U5 ..80.00
S.Duquesne,Pa. U5 ..80.00
Sterling,Ill. N15 ....80.00
Youngstown R2 ....80.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$99.50
Buffalo R2 ....99.50
Canton,O. R2 ....102.00
Clairton,Pa. U5 ....99.50
Conshohocken,Pa. A3..104.50
Ensley,Ala. T2 ....99.50
Fairfield,Ala. T2 ....99.50
Farrell,Pa. S3 ....99.50
Fontana,Calif. K1 ....109.00
Gary,Ind. U5 ....99.50
Geneva,Utah C11 ....99.50
Houston S5 ....104.50
Johnstown,Pa. B2 ....99.50
Lackawanna,N.Y. B2..99.50
LosAngeles B3 ....109.00
Midland,Pa. C18 ....99.50
Munhall,Pa. U5 ....99.50
Owensboro,Ky. G8 ....99.50
Seattle B3 ....109.00
Sharon,Pa. S3 ....99.50
S.Chicago R2, U5, W14 99.50
S.Duquesne,Pa. U5 ....99.50
S.SanFrancisco B3 ....109.00
Warren,O. C17 ....99.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ..$119.00
Bridgeport,Conn. C32..119.00
Buffalo R2 ....119.00
Canton,O. R2, T7 ....119.00
Conshohocken,Pa. A3..126.00
Detroit S41 ....119.00
Economy,Pa. B14 ....119.00
Farrell,Pa. S3 ....119.00
Fontana,Calif. K1 ...140.00
Gary,Ind. U5 ....119.00
Houston S5 ....124.00
Ind.Harbor,Ind. Y1 ..119.00
Johnstown,Pa. B2 ....119.00
Lackawanna,N.Y. B2..119.00
LosAngeles B3 ....139.00
Lowellville,O. S3 ....119.00
Massillon,O. R2 ....119.00
Midland,Pa. C18 ....119.00
Munhall,Pa. U5 ....119.00
Owensboro,Ky. G8 ....119.00
Sharon,Pa. S3 ....119.00
S.Chicago R2,U5,W14 119.00
S.Duquesne,Pa. U5 ...119.00
Struthers,O. Y1 ....119.00
Warren,O. C17 ....119.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ....$122.50
Canton,O. R2 ....125.00
Cleveland R2 ....122.50
Gary,Ind. U5 ....122.50
S Chicago,Ill. R2, W14 122.50
S.Duquesne,Pa. U5 ...122.50
Warren,O. C17 ....122.50

SKELP
Aliquippa,Pa. J5 ....5.05
Munhall,Pa. U5 ....5.05
Pittsburgh J5 ....5.05
Warren,O. R2 ....5.05
Youngstown R2, U5 ....5.05

WIRE RODS
AlabamaCity,Ala. R2 ..6.40
Aliquippa,Pa. J5 ....6.40
Alton,Ill. L1 ....6.60
Bartonville,Ill. K4 ....6.50
Buffalo W12 ....6.40
Cleveland A7 ....6.40
Donora,Pa. A7 ....6.40
Fairfield,Ala. T2 ....6.40
Houston S5 ....6.65
IndianaHarbor,Ind. Y1 ..6.40
Johnstown,Pa. B2 ....6.40
Joliet,Ill. A7 ....6.40
KansasCity,Mo. S5 ....6.65
Kokomo,Ind. C16 ....6.50
LosAngeles B3 ....7.20
Minnequa,Colo. C10 ....6.65
Monessen,Pa. P7 ....6.40
Pittsburg,Calif. C11 ....7.20
Portsmouth,O. P12 ....6.40
Roebling,N.J. R5 ....6.50
S.Chicago,Ill. R2, W14..6.40
SparrowsPoint,Md. B2..6.50
Sterling,Ill.(1) N15 ....6.40
Sterling,Ill. N15 ....6.50
Struthers,O. Y1 ....6.40
Worcester,Mass. A7 ....6.70

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 ..5.50
Aliquippa,Pa. J5 ....5.50
Atlanta A11 ....5.70
Bessemer,Ala. T2 ....5.50
Bethlehem,Pa. B2 ....5.55
Birmingham C15 ....5.50
Clairton,Pa. U5 ....5.50
Fairfield,Ala. T2 ....5.50
Fontana,Calif. K1 ....6.30
Gary,Ind. U5 ....5.50
Geneva,Utah C11 ....5.50
Houston S5 ....5.60
Ind.Harbor,Ind. I-2, Y1..5.50
Johnstown,Pa. B2 ....5.55
Joliet,Ill. P22 ....5.50
KansasCity,Mo. S5 ....5.60
Lackawanna,N.Y. B2 ..5.55
LosAngeles B3 ....6.20
Minnequa,Colo. C10 ....5.80
Munhall,Pa. U5 ....5.50
Niles,Calif. P1 ....6.25
Phoenixville,Pa. P4 ....5.55
Portland,Oreg. O4 ....6.25
Seattle B3 ....6.25
S.Chicago,Ill. U5, W14 5.50
S.SanFrancisco B3 ....6.15
Sterling,Ill. N15 ....5.50
Torrance,Calif. C11 ....6.20
Weirton,W.Va. W6 ....5.50

Wide Flange
Bethlehem,Pa. B2 ....5.55
Clairton,Pa. U5 ....5.50
Fontana,Calif. K1 ....6.45
IndianaHarbor,Ind. I-2 ..5.50
Lackawana,N.Y. B2 ....5.55
Munhall,Pa. U5 ....5.50
Phoenixville,Pa. P4 ....5.55
S.Chicago,Ill. U5 ....5.50
Sterling,Ill. N15 ....5.50
Weirton,W.Va. W16 ....5.50

Alloy Std. Shapes
Aliquippa,Pa. J5 ....6.80
Clairton,Pa. U5 ....6.80
Gary,Ind. U5 ....6.80
Houston S5 ....6.90
Munhall,Pa. U5 ....6.80
S.Chicago,Ill. U5, W14..6.80

H.S., L.A., Std. Shapes
Aliquippa,Pa. J5 ....8.05
Bessemer,Ala. T2 ....8.05
Bethlehem,Pa. B2 ....8.10
Clairton,Pa. U5 ....8.05
Fairfield,Ala. T2 ....8.05
Fontana,Calif. K1 ....8.85
Gary,Ind. U5 ....8.05
Geneva,Utah C11 ....8.05
Houston S5 ....8.15
Ind.Harbor,Ind. I-2, Y1..8.05
Johnstown,Pa. B2 ....8.10
KansasCity,Mo. S5 ....8.15
Lackawanna,N.Y. B2 ..8.10
LosAngeles B3 ....8.75
Munhall,Pa. U5 ....8.05
Seattle B3 ....8.80
S.Chicago,Ill. U5, W14..8.05
S.SanFrancisco B3 ....8.70
Sterling,Ill. N15 ....7.75
Struthers,O. Y1 ....8.05

H.S., L.A., Wide Flange
Bethlehem,Pa. B2 ....8.10
Ind.Harbor,Ind. I-2 ....8.05
Lackawanna,N.Y. B2 ..8.10
Munhall,Pa. U5 ....8.05
S.Chicago,Ill. U5 ....8.05
Sterling,Ill. N15 ....7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 ....5.55
Ind.Harbor,Ind. I-2 ....5.50
Lackawanna,N.Y. B2 ..5.55
Munhall,Pa. U5 ....5.50
S.Chicago,Ill. I-2, U5 ..5.50

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ....6.50
Lackawanna,N.Y. B2 ..6.50
Munhall,Pa. U5 ....6.50
S.Chicago,Ill. I-2, U5 ..6.50
Weirton,W.Va. W6 ....6.50

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..5.30
Aliquippa,Pa. J5 ....5.30
Ashland,Ky.(15) A10 ..5.30
Atlanta A11 ....5.50
Bessemer,Ala. T2 ....5.30
Clairton,Pa. U5 ....5.30
Claymont,Del. C22 ....5.30
Cleveland J5, R2 ....5.30
Coatesville,Pa. L7 ....5.30
Conshohocken,Pa. A3 ..5.30
Ecorse,Mich. G5 ....5.30
Fairfield,Ala. T2 ....5.30
Farrell,Pa. S3 ....5.30
Fontana,Calif.(30) K1 ..6.10
Gary,Ind. U5 ....5.30
Geneva,Utah C11 ....5.30
GraniteCity,Ill. G4 ....5.40
Harrisburg,Pa. P4 ....5.30
Houston S5 ....5.40
Ind.Harbor,Ind. I-2, Y1 5.30
Johnstown,Pa. B2 ....5.30
Lackawanna,N.Y. B2 ..5.30
Mansfield,O. E6 ....5.30
Minnequa,Colo. C10 ....6.15
Munhall,Pa. U5 ....5.30
Newport,Ky. A2 ....5.30
Pittsburgh J5 ....5.30
Riverdale,Ill. A1 ....5.30
Seattle B3 ....6.20
Sharon,Pa. S3 ....5.30
S.Chicago,Ill. U5, W14..5.30
SparrowsPoint,Md. B2..5.30
Sterling,Ill. N15 ....5.30
Steubenville,O. W10 ..5.30
Warren,O. R2 ....5.30
Youngstown U5, Y1 ....5.30
Youngstown(27) R2 ....5.30

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 ....7.05
Fontana,Calif. K1 ....7.85
Geneva,Utah C11 ....7.05
Houston S5 ....7.15
Johnstown,Pa. B2 ....7.05
SparrowsPoint,Md. B2 ..7.05

PLATES, Wrought Iron
Economy,Pa. B14 ....13.55

PLATES, H.S., L.A.
Aliquippa,Pa. J5 ....7.95
Ashland,Ky. A10 ....7.95
Bessemer,Ala. T2 ....7.95
Clairtown,Pa. U5 ....7.95
Claymont,Del. C22 ....7.95
Cleveland J5, R2 ....7.95
Coatesville,Pa. L7 ....7.95
Conshohocken,Pa. A3 ..7.95
Economy Pa. B14 ....7.95
Ecorse,Mich. G5 ....7.95
Fairfield,Ala. T2 ....7.95
Farrell,Pa. S3 ....7.95
Fontana,Calif.(30) K1 ..8.75
Gary,Ind. U5 ....7.95
Geneva,Utah C11 ....7.95
Houston S5 ....8.05
Ind.Harbor,Ind. I-2, Y1.7.95
Johnstown,Pa. B2 ....7.95
Munhall,Pa. U5 ....7.95
Pittsburgh J5 ....7.95
Seattle B3 ....8.85
Sharon,Pa. S3 ....7.95
S.Chicago,Ill. U5, W14..7.95
SparrowsPoint,Md. B2..7.95
Warren,O. R2 ....7.95
Youngstown U5, Y1 ....7.95

PLATES, Alloy
Aliquippa,Pa. J5 ....7.50
Claymont,Del. C22 ....7.50
Coatesville,Pa. L7 ....7.50
Economy,Pa. B14 ....7.50
Farrell,Pa. S3 ....7.50
Fontana,Calif. K1 ....8.30
Gary,Ind. U5 ....7.50
Houston S5 ....7.60
Ind.Harbor,Ind. Y1 ....7.50
Johnstown,Pa. B2 ....7.50
Lowellville,O. S3 ....7.50
Munhall,Pa. U5 ....7.50
Newport,Ky. A2 ....7.50
Pittsburgh J5 ....7.50
Seattle B3 ....8.40
Sharon,Pa. S3 ....7.50
S.Chicago,Ill. U5, W14..7.50
SparrowsPoint,Md. B2..7.50
Youngstown Y1 ....7.50

FLOOR PLATES
Cleveland J5 ....6.375
Conshocken,Pa. A3 ..6.375
Ind.Harbor,Ind. I-2 ..6.375
Munhall,Pa. U5 ....6.375
Pittsbugh J5 ....6.375
S.Chicago,Ill. U5 ....6.375

PLATES, Ingot Iron
Ashland c.l. (15) A10 ..5.55
Ashland l.c.l. (15) A10 ..6.05
Cleveland c.l. R2 ....6.05
Warren,O. c.l. R2 ....6.05

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ..5.675
Aliquippa,Pa. (9) J5 ..5.675
Alton, Ill. L1 ....5.875
Atlanta(9) A11 ....5.875
Bessemer,Ala.(9) T2 ..5.675
Birmingham(9) C15 ..5.675
Buffalo(9) R2 ....5.675
Canton,O.(23) R2 ....6.15
Clairton,Pa. (9) U5 ..5.675
Cleveland(9) R2 ....5.675
Ecorse,Mich.(9) G5 ..5.675
Emeryville,Calif. J7 ..6.425
Fairfield,Ala.(9) T2 ..5.675
Fairless,Pa.(9) U5 ....5.825
Fontana,Calif.(9) K1 ..6.375
Gary,Ind.(9) U5 ....5.675
Houston(9) S5 ....5.925
Ind.Harbor(9) I-2, Y1 5.675
Johnstown,Pa.(9) B2 ..5.675
Joliet,Ill. P2 ....5.675
KansasCity,Mo.(9) S5..5.925
Lackawanna(9) B2 ...5.675
LosAngeles(9) B3 ....6.375
Massillon,O.(23) R2 ...6.15
Midland,Pa.(23) C18 ..6.025
Milton,Pa. M18 ....5.825
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 ....6.375
Owensboro,Ky.(9) G8 ..6.025
Pittsburg,Calif.(9) C11..6.375
Pittsburgh(9) J5 ....5.675
Portland,Oreg. O4 ....6.425
Riverdale,Ill.(9) A1 ..5.675
Seattle A24, B3, N14..6.425
S.Ch'c'go(9)R2,U5,W14 5.675
S.Duquesne,Pa.(9) U5..5.675
S.SanFran..Calif.(9)B3 6.425
Sterling,Ill.(1)(9) N15..5.675
Sterling,Ill.(9) N15 ....5.775
Struthers,O.(9) Y1 ....5.675
Tonawanda,N.Y. B12..5.675
Torrance,Calif.(9) C11.6.375
Warren,O. C17 ....6.052
Youngstown(9) R2, U5..5.675

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 ....6.725
Bethlehem,Pa. B2 ....6.725
Bridgeport,Conn. C32 ..6.80
Buffalo R2 ....6.725
Canton,O. R2, T7 ....6.725
Clairton,Pa. U5 ....6.275
Detroit S41 ....6.725
Economy,Pa. B14 ....6.725
Ecorse,Mich. G5 ....6.725
Fairless,Pa. U5 ....6.875
Farrell,Pa. S3 ....6.725
Fontana,Calif. K1 ....7.775
Gary,Ind. U5 ....6.725
Houston S5 ....6.975
Ind.Harbor,Ind. I-2, Y1.6.725
Johnstown,Pa. B2 ....6.725
KansasCity,Mo. S5 ....6.975
Lackawanna,N.Y. B2 ..6.725
LosAngeles B3 ....7.775
Lowellville,O. S3 ....6.725
Massillon,O. R2 ....6.725
Midland,Pa. C18 ....6.725
Owensboro,Ky. G8 ....6.725
Pittsburgh J5 ....6.725
Sharon,Pa. S3 ....6.725
S.Chicago R2, U5, W14 6.725
S.Duquesne,Pa. U5 ....6.725
Struthers,O. Y1 ....6.725
Warren,O. C17 ....6.725
Youngstown U5 ....6.725

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 ....8.30
Bessemer,Ala. T2 ....8.30
Bethlehem,Pa. B2 ....8.30
Clairton,Pa. U5 ....8.30
Cleveland R2 ....8.30
Ecorse,Mich. G5 ....8.30
Fairfield,Ala. T2 ....8.30
Fontana,Calif. K1 ....9.00
Gary,Ind. U5 ....8.30
Houston S5 ....8.55
Ind.Harbor,Ind. Y1 ....8.30
Johnstown,Pa. B2 ....8.30
KansasCity,Mo. S5 ....8.55
Lackawanna,N.Y. R2 ..8.30
LosAngeles B3 ....9.00
Pittsburgh J5 ....8.30
Seattle B3 ....9.05
S.Chicago,Ill. R2, W14 8.30
S.Duquesne,Pa. U5 ....8.30
S.SanFrancisco B3 ....9.05
Struthers,O. Y1 ....8.30
Youngstown U5 ....8.30

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..5.825
Houston(9) S5 ....5.925
KansasCity,Mo.(9)S5 ..5.925
Lackawanna(9) B2 ....5.675
Sterling,Ill. N15 ....5.775
Sterling,Ill.(1) N15 ..5.675
Tonawanda,N.Y. B12 ..5.675

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 ....5.675
Atlanta A11 ....5.875
Joliet,Ill. P22 ....5.675
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 ....6.375
Pittsburgh J5 ....5.675
Portland,Oreg. O4 ....6.425
SanFrancisco S7 ....6.52
Seattle B3 ....6.425

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 ....6.80
Clairton,Pa. U5 ....6.80
Gary,Ind. U5 ....6.80
Houston S5 ....7.05
KansasCity,Mo. S5 ....7.05
Pittsburgh J5 ....6.80
Youngstown U5 ....6.80

BARS, C.F. Leaded (Including leaded extra) Carbon
LosAngeles P2, S30 ..11.75*

Alloy
Ambridge,Pa. W18 ..10.175
BeaverFalls,Pa. M12..10.175
Camden,N.J. P13 ....10.35
Chicago W18 ....10.175
Elyria,O. W8 ....10.175
Monaca,Pa. S17 ....10.175
Newark,N.J. W18 ....10.35
SpringCity,Pa. K3 ....10.35

*Grade A; add 0.05c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....7.65
BeaverFalls,Pa. M12,R2 7.65
Birmingham C15 ....8.25
Buffalo B5 ....7.70
Camden,N.J. P13 ....8.10
Carnegie,Pa. C12 ....7.65
Chicago W18 ....7.65
Cleveland A7, C20 ....7.65
Detroit B5, P17 ....7.85
Detroit S41 ....7.65
Donora,Pa. A7 ....7.65
Elyria,O. W8 ....7.65
FranklinPark,Ill. N5 ..7.65
Gary,Ind. R2 ....7.65
GreenBay,Wis. F7 ....7.65
Hammond,Ind. J5, L2 7.65
Hartford,Conn. R2 ....8.15
Harvey,Ill. B5 ....7.65
LosAngeles(49) S30 ....9.10
LosAngeles(49) P2, R2 9.10
Mansfield,Mass. B5 ....8.20
Massillon,O. R2, R8 ...7.65
Midland,Pa. C18 ....7.65
Monaca,Pa. S17 ....7.65
Newark,N.J. W18 ....8.10
NewCastle,Pa.(17) B4 ..7.65
Pittsburgh J5 ....7.65
Plymouth,Mich. P5 ....7.90
Putnam,Conn. W18 ....8.20
Readville,Mass. C14 ....8.20
S.Chicago,Ill. W14 ....7.65
SpringCity,Pa. K3 ....8.10
Struthers,O. Y1 ....7.65
Warren,O. C17 ....7.65
Waukegan,Ill. A7 ....7.65
Willimantic,Conn. J5 ..8.15
Youngstown F3, Y1 ..7.65

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19.6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....9.025
BeaverFalls,Pa.M12,R2 9.025
Bethlehem,Pa. B2 ....9.025
Bridgeport,Conn. C32 ..9.175
Buffalo B5 ....9.025
Camden,N.J. P13 ....9.20
Canton,O. T7 ....9.025
Carnegie,Pa. C12 ....9.025
Chicago W18 ....9.025
Cleveland A7, C20 ....9.025
Detroit B5, P17 ....9.225
Detroit S41 ....9.025
Donora,Pa. A7 ....9.025
Elyria,O. W8 ....9.025
FranklinPark,Ill. N5 ..9.025
Gary,Ind. R2 ....9.025
GreenBay,Wis. F7 ....9.025
Hammond,Ind. J5, L2..9.025
Hartford,Conn. R2 ....9.325
Harvey,Ill. R5 ....9.025
Lackawanna,N.Y. B2..9.025
LosAngeles P2, S30 ....11.00
Mansfield,Mass. B5 ....9.325
Massillon,O. R2, R8 ..9.025
Midland,Pa. C18 ....9.025
Monaca,Pa. S17 ....9.025
Newark,N.J. W18 ....9.20
Plymouth,Mich. P5 ....9.225
S.Chicago,Ill. W14 ....9.025
SpringCity,Pa. K3 ....9.20
Struthers,O. Y1 ....9.025
Warren,O. C17 ....9.025
Waukegan,Ill. A7 ....9.025
Willimantic,Conn. J5 ..9.325
Worcester,Mass. A7 ..9.325
Youngstown F3, Y1 ...9.025

BARS, Reinforcing, Billet (To Fabricators)

AlabamaCity,Ala. R2 ..5.675
Atlanta A11 .....5.675
Birmingham C15 ....5.675
Buffalo R2 .....5.675
Cleveland R2 .....5.675
Ecorse,Mich. G5 .....5.675
Emeryville,Calif. J7 ...6.425
Fairfield,Ala. T2 .....5.675
Fairless Pa. U5 .....5.825
Fontana,Calif. K1 ....6.375
Ft.Worth,Tex(4)(26)T4 5.925
Gary,Ind. U5 .....5.675
Houston S5 .....5.925
Ind.Harbor,Ind. I-2,Y1 5.675
Johnstown,Pa. B2 ....5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo. S5 .....5.925
Kokomo,Ind. C16 ....5.775
Lackawanna,N.Y. B2..5.675
LosAngeles B3 .....6.375
Madison,Ill. L1 .....5.875
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 .....6.375
Pittsburg,Calif. C11 ..6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 ....6.425
SandSprings,Okla. S5 ..5.925
Seattle A24, B3, N14 .6.425
S.Chicago,Ill. R2, W14.5.675
S.Duquesne,Pa. U5 ....5.675
S.SanFrancisco B3 ....6.425
SparrowsPoint,Md. B2..5.675
Sterling,Ill.(1) N15 ..5.675
Sterling Ill. N15 .....5.775
Struthers,O. Y1 .....5.675
Tonawanda,N.Y. B12 ..6.10
Torrance,Calif. C11 ...6.375
Youngstown R2, U5 ..5.675

BARS, Reinforcing, Billet (Fabricated: To Consumers)

Baltimore B2 .....7.42
Boston B2, U8 .....8.15
Chicago U8 .....7.41
Cleveland U8 .....7.39
Houston S5 .....7.60
Johnstown,Pa. B2 .....7.33
KansasCity,Mo. S5 ....7.60
Lackawanna,N.Y. B2 ..7.35
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.80
Philadelphia U8 .....7.63
Pittsburgh J5, U8 .....7.35
SandSprings Okla. S5 ..7.60
Seattle A24, B3, N14 ..7.95
SparrowsPt.,Md. B2 ...7.33
St.Paul U8 .....8.17
Williamsport,Pa. S19 ...7.25

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.90
Economy,Pa.(D.R.)B14 18.55
Economy(Staybolt)B14 19.00
McK.Rks.(S.R.) L5 ..14.50
McK.Rks.(D.R.) L5 ...19.80
McK.Rks.(Staybolt)L5. 20.95

BARS, Rail Steel

ChicagoHts.(3) C2, I-2.5.575
ChicagoHts.(4)(44) I-2.5.675
ChicagoHts.(4) C2 ....5.675
Franklin,Pa.(3) F5 ...5.575
Franklin,Pa.(4) F5 ...5.675
JerseyShore,Pa.(3) J8 ..5.55
Marion,O.(3) F11 ....5.575
Tonawanda(3) B12 ...5.575
Tonawanda(4) B12 ....6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

AlabamaCity,Ala. R2 ..5.10
Allenport,Pa. P7 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky.(8) A10 ...5.10
Cleveland J5, R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit(8) M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Fairless,Pa. U5 .....5.15
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.525
Gary,Ind. U5 .....5.10
Geneva Utah C11 .....5.20
GraniteCity,Ill.(8) G4 ..5.20
Ind.Harbor,Ind. I-2, Y1.5.10
Irvin,Pa. U5 .....5.10
Lackawanna,N.Y. B2 ..5.10
Mansfield,O. E6 .....5.10
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Niles,O. M21, S3 .....5.10
Pittsburg,Calif. C11 ...5.80
Pittsburgh J5 .....5.10
Portsmouth O. P12 ....5.10
Riverdale,Ill. A1 .....5.10
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14 ..5.10
SparrowsPoint,Md. B2 ..5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5, Y1 ....5.10

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21, S3 .....6.275

SHEETS, H.R., Alloy

Gary Ind. U5 .....8.40
Ind.Harbor,Ind. Y1 ....8.40
Irvin,Pa. U5 .....8.40
Munhall,Pa. U5 .....8.40
Newport,Ky. A2 .....8.40
Youngstown U5, Y1 ....8.40

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....7.525
Ashland,Ky. A10 .....7.525
Cleveland J5, R2 .....7.525
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.525
Fairless Pa. U5 .....7.575
Farrell,Pa. S3 .....7.525
Fontana,Calif. K1 .....8.25
Gary,Ind. U5 .....7.525
Ind.Harbor,Ind. I-2, Y1 7.525
Irvin,Pa. U5 .....7.525
Lackawanna(35) B2 ...7.525
Munhall,Pa. U5 .....7.525
Niles,O. S3 .....7.525
Pittsburgh J5 .....7.525
S.Chicago,Ill. U5, W14.7.525
Sharon,Pa. S3 .....7.525
SparrowsPoint(36) B2..7.525
Warren,O. R2 .....7.525
Weirton W.Va. W6 ....7.525
Youngstown U5, Y1 ....7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ...5.35
Cleveland R2 .....5.875
Warren,O. R2 .....5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....7.05
Middletown,O. A10 ....6.775
Warren,O. R2 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 .6.275
Aliquippa,Pa. J5 ....6.275
Allenport,Pa. P7 .....6.275
Cleveland J5, R2 .....6.275
Conshohocken,Pa. A3 ..6.325
Detroit M1 .....6.275
Ecorse,Mich. G5 .....6.275
Fairfield,Ala. T2 .....6.275
Fairless Pa. U5 .....6.325
Follansbee,W.Va. F4 ..6.275
Fontana,Calif. K1 .....7.40
Gary,Ind. U5 .....6.275
GraniteCity,Ill. G4 ....6.375
Ind.Harbor,Ind. I-2, Y1 6.275
Irvin,Pa. U5 .....6.275
Lackawanna,N.Y. B2 ..6.275
Mansfield,O. E6 .....6.275
Middletown,O. A10 ....6.275
Newport,Ky. A2 .....6.275
Pittsburg,Calif. C11 ...7.225
Pittsburgh J5 .....6.275
Portsmouth O. P12 ....6.275
SparrowsPoint,Md. B2 .6.275
Steubenville,O. W10 ..6.275
Warren,O. R2 .....6.275
Weirton,W.Va. W6 ....6.275
Yorkville,O. W10 .....6.275
Youngstown Y1 .....6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....9.275
Cleveland J5, R2 .....9.275
Ecorse,Mich. G5 .....9.275
Fairless,Pa. U5 .....9.325
Fontana,Calif. K1 ....10.40
Gary,Ind. U5 .....9.275
Ind.Harbor,Ind. I-2, Y1 9.275
Lackawanna(37) B2 ..9.275
Pittsburgh J5 .....9.275
SparrowsPoint(38) B2..9.275
Warren,O. R2 .....9.275
Weirton,W.Va. W6 ....9.275
Youngstown Y1 .....9.275

SHEETS, Culvert

	Cu Steel	Cu Fe
Ala.City,Ala. R2	7.225	....
Ashland,Ky. A10	7.225	7.475
Canton,O. R2	7.225	7.75
Fairfield,Ala. T2	7.225	7.475
Gary,Ind. U5	7.225	7.475
GraniteCity,Ill.G4	7.325	....
Ind.Harbor I-2	7.225	7.475
Irvin,Pa. U5	7.225	7.475
Kokomo,Ind. C16	7.325	....
MartinsFry. W10	7.225	7.475
Pitts.Calif. C11	7.975	....
Pittsburgh J5	7.225	....
SparrowsPt. B2	7.225	....

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ....7.475

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2.6.875‡
Ashland,Ky. A10 ....6.875‡
Canton,O. R2 .....6.875‡
Dover,O. E6 .....6.875†
Fairfield,Ala. T2 .....6.875†
Gary,Ind. U5 .....6.875†
GraniteCity,Ill. G4 ...6.975*
Ind.Harbor,Ind. I-2 ...6.875†
Irvin,Pa. U5 .....6.875†
Kokomo,Ind. C16 ....6.975‡
MartinsFerry,O. W10..6.875*
Middletown,O. A10 ..6.875†
Pittsburg,Calif. C11 ..7.625*
Pittsburgh J5 .....6.875†
SparrowsPt.,Md. B2..6.875†
Warren,O. R2 .....6.875†
Weirton,W.Va. W6 ...6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....10.125
Pittsburgh J5 .....10.125
SparrowsPt.(39) B2 ..10.025

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.275
Irvin,Pa. U5 .....7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....7.125
Middletown,O. A10 ....7.125

SHEETS, Electrogalvanized

Cleveland(28) R2 .....7.65
Niles,O.(28) R2 .....7.65
Weirton,W.Va. W6 ....7.50
Youngstown J5 .....7.50

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 9.525
Butler,Pa. A10 (type 2) 9.625

SHEETS, Enameling Iron

Ashland Ky. A10 .....6.775
Cleveland R2 .....6.775
Fairfield,Ala. T2 .....6.775
Gary,Ind. U5 .....6.775
Ind.Harbor,Ind. I-2, Y1 6.775
Irvin,Pa. U5 .....6.775
Middletown,O. A10 ....6.775
Niles,O. M21, S3 .....6.775
Youngstown Y1 .....6.775

BLUED STOCK, 29 Gage

Dover,O. E6 .....8.70
Follansbee,W.Va. F4 ...8.70
Ind.Harbor,Ind. I-2 ....8.70
Mansfield,O. E6 .....8.70
Warren O. R2 .....8.70
Yorkville,O. W10 .....8.70

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.225
Gary,Ind. U5 .....7.225
Mansfield,O. E6 .....7.225
Middletown,O. A10 ....7.225
Niles,O. M21, S3 ....7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.625

Key to Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A24 Alaska Steel Mills Inc.

B1 Babcock & Wilcox
B2 Bethlehem Steel Co.
B3 Bethlehem Steel Co., Pacific Coast Div.
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel ofN.Eng.

D2 Detroit Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&FuelAssoc.
E2 Eastern Stainless Steel
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Specailty Wire Co. Inc.
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N20 Neville Ferro Alloy Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copprweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless & Strip Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.
S43 Seymour Mfg. Co.
S44 Screw & Bolt Corp. of America

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.
U11 Union Carbide Metals Co.
U13 Union Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Steel Div., Associated Spring Corp.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	5.10
Allenport,Pa. P7	5.10
Alton,Ill. L1	5.30
Ashland,Ky.(8) A10	5.10
Atlanta A11	5.10
Bessemer,Ala. T2	5.10
Birmingham C15	5.10
Buffalo(27) R2	5.10
Conshohocken,Pa. A3	5.15
Detroit M1	5.10
Ecorse,Mich. G5	5.10
Fairfield,Ala. T2	5.10
Farrell,Pa. S3	5.10
Fontana,Calif. K1	5.825
Gary,Ind. U5	5.10
Ind.Harbor,Ind. I-2, Y1	5.10
Johnstown,Pa.(25) B2	5.10
Lackaw'na,N.Y.(25) B2	5.10
LosAngeles(25) B3	5.85
LosAngeles C1	8.60
Minnequa,Colo. C10	6.20
Riverdale,Ill. A1	5.10
SanFrancisco S7	6.60
Seattle(25) B3	6.10
Seattle N14	6.60
Sharon,Pa. S3	5.10
S.Chicago,Ill. W14	5.10
S.SanFrancisco(25) B3	5.85
SparrowsPoint,Md. B2	5.10
Torrance,Calif. C11	5.85
Warren,O. R2	5.10
Weirton,W.Va. W6	5.10
Youngstown U5	5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	8.40
Farrell,Pa. S3	8.40
Gary,Ind. U5	8.40
Houston S5	8.65
Ind.Harbor,Ind. Y1	8.40
KansasCity,Mo. S5	8.65
LosAngeles B3	9.60
Lowellville,O. S3	8.40
Newport,Ky. A2	8.40
Sharon,Pa. A2, S3	8.40
S.Chicago,Ill. W14	8.40
Youngstown U5, Y1	8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky. A10	7.575
Bessemer,Ala. T2	7.575
Conshohocken,Pa. A3	7.575
Ecorse,Mich. G5	7.575
Fairfield,Ala. T2	7.575
Farrell,Pa. S3	7.575
Gary,Ind. U5	7.575
Ind.Harbor,Ind. I-2, Y1	7.575
Lackawanna,N.Y. B2	7.575
LosAngeles(25) B3	8.325
Seattle(25) B3	8.575
Sharon,Pa. S3	7.575
S.Chicago,Ill. W14	7.575
S.SanFrancisco(25) B3	8.325
SparrowsPoint,Md. B2	7.575
Warren,O. R2	7.575
Weirton,W.Va. W6	7.575
Youngstown U5, Y1	7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	5.35
Warren,O. R2	5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	7.425
Baltimore T6	7.425
Boston T6	7.975
Buffalo S40	7.425
Cleveland A7, J5	7.425
Dearborn,Mich. S3	7.425
Detroit D2, M1, P20	7.425
Dover,O. G6	7.425
Evanston,Ill. M22	7.525
Farrell,Pa. S3	7.425
Follansbee,W.Va. W10	7.425
Fontana,Calif. K1	9.20
FranklinPark,Ill. T6	7.525
Ind.Harbor,Ind. Y1	7.425
Indianapolis S41	7.575
LosAngeles C1, S41	9.30
McKeesport,Pa. E10	7.525
NewBedford,Mass. R10	7.875
NewBritain,Conn. S15	7.875
NewCastle,Pa. B4, E5	7.425
NewHaven,Conn. D2	7.875
NewKensington,Pa. A6	7.425
Pawtucket,R.I. R3	7.975
Pawtucket,R.I. N8	7.975
Philadelphia P24	7.875
Pittsburgh J5	7.425
Riverdale,Ill. A1	7.525
Rome,N.Y.(32) R6	7.425
Sharon,Pa. S3	7.425
Trenton,N.J. R5	7.875
Wallingford,Conn. W2	7.875
Warren,O. R2, T5	7.425
Worcester,Mass. A7	7.975

STRIP, Cold-Rolled Alloy

Boston T6	15.90
Carnegie,Pa. S18	15.55
Cleveland A7	15.55
Dover,O. G6	15.55
Farrell,Pa. S3	15.56
FranklinPark,Ill. T6	15.55
Harrison N.J. S18	15.55
Indianapolis S41	15.70
LosAngeles S41	17.75
Lowellville,O. S3	15.55
Pawtucket,R.I. N8	15.90
Riverdale,Ill. A1	15.55
Sharon,Pa. S3	15.55
Worcester,Mass. A7	15.85
Youngstown S41	15.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.80
Dearborn,Mich. S3	10.80
Dover,O. G6	10.80
Farrell,Pa. S3	10.80
Ind.Harbor,Ind. Y1	10.80
Sharon,Pa. S3	10.80
Warren,O. R2	10.80

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	....	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. S3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Farrell,Pa. S3	8.95	10.40	12.60	15.60	18.55
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis S41	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.80	14.80	17.80	....
LosAngeles S41	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	9.85	10.40	12.60	15.60	....
NewYork W3	....	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	....	10.70	12.90	15.90	18.85
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	18.85	22.95	27.80
Buffalo W12	18.85	....	....
Fostoria,O. S1	19.05	22.15	....
FranklinPark,Ill. T6	19.20	23.30	28.15
Harrison,N.J. C18	18.85	22.95	27.80
NewYork W3	18.85	22.95	27.80
Palmer,Mass. W12	18.85	....	....
Trenton,N.J. R5	18.85	22.95	27.80
Worcester,Mass. A7, T6	18.85	22.95	27.80
Youngstown S41	19.20	23.30	28.15

STRIP, Galvanized (Continuous)

Farrell,Pa. S3	7.50
Sharon,Pa. S3	7.50

TIGHT COOPERAGE HOOP

Atlanta A11	5.65
Farrell,Pa. S3	5.525
Riverdale,Ill. A1	5.675
Sharon,Pa. S3	5.525
Youngstown U5	5.525

Weirton,W.Va. W6	10.80
Youngstown Y1	10.80

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	8.175

STRIP, C.R. Electrogalvanized

Cleveland A7	7.425*
Dover,O. G6	7.425*
Evanston,Ill. M22	7.525*
McKeesport,Pa. E10	7.50*
Riverdale,Ill. A1	7.525*
Warren,O. B9, S3, T5	7.425*
Worcester,Mass. A7	7.975
Youngstown S41, Y1	7.425*

*Plus galvanizing extras.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$9.10	$9.35	$9.75
Fairfield,Ala. T2	9.20	9.45	9.85
Fairless,Pa. U5	9.20	9.45	9.85
Fontana,Calif. K1	9.75	10.00	10.40
Gary,Ind. U5	9.10	9.35	9.75
GraniteCity,Ill. G4	9.20	9.45	9.60
IndianaHarbor,Ind. I-2, Y1	9.10	9.35	9.75
Irvin,Pa. U5	9.10	9.35	9.75
Niles,O. R2	9.10	9.35	9.75
Pittsburg,Calif. C11	9.75	10.00	10.40
SparrowsPoint,Md. B2	9.10	9.35	9.75
Weirton,W.Va. W6	9.10	9.35	9.75
Yorkville,O. W10	9.10	9.35	9.75

ELECTROLYTIC TIN-COATED SHEET Dollars per 100 lb)

Aliquippa,Pa. J5 (21-27 Ga.)	7.90	8.10	....
IndianaHarbor,Ind. Y1 (20-27 Ga.)	7.90	....	....
Niles,O. R2 (20-27 Ga.)	7.90	8.10	8.30

TIN PLATE, Hot Dipped 1.25 Common Coke lb	1.50 lb
Aliquippa,Pa. J5	$10.40	$10.65
Fairfield,Ala. T2	10.50	10.75
Fontana,Calif.K1	11.05	11.30
Gary,Ind. U5	10.40	10.65
Ind.Harb. Y1	10.40	10.65
Irvin,Pa. U5	10.40	10.65
Pitts.,Calif. C11	11.05	11.30
Sp.Pt.,Md. B2	10.40	10.65
Weirton,W.Va.W6	10.40	10.65
Yorkville,O. W10	10.40	10.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$8.20
Fairfield,Ala. T2	8.30
Fairless,Pa. U5	8.30
Fontana,Calif. K1	8.85
Gary Ind. U5	8.20
GraniteCity,Ill. G4	8.30
Ind.Harbor,Ind. I-2, Y1	8.20
Irvin,Pa. U5	8.20
Niles,O. R2	8.20
Pittsburg,Calif. C11	8.85
SparrowsPoint,Md. B2	8.20
Weirton,W.Va. W6	8.20
Yorkville,O. W10	8.20

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5	7.85
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. Y1	7.85
Irvin,Pa. U5	7.85
Yorkville,O. W10	7.85

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5	$10.05
Irvin,Pa. U5	10.05

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.70	12.40	13.35	14.66
Brackenridge,Pa. A4	....	....	12.40	13.55	14.65
GraniteCity,Ill. G4	9.975*	11.30*	12.00*	13.15*	....
IndianaHarbor,Ind. I-2	9.875*	11.20*	11.90*	13.05*	....
Mansfield,O. E6	9.875*	11.70	12.40	13.55	14.65
Newport,Ky. A2	9.875	11.70*	12.40*	13.55*	14.65*
Niles,O. M21	9.875*	11.70	12.40	13.55	....
Vandergrift,Pa. U5	9.875*	11.70	12.40	13.55	14.65
Warren,O. R2	9.875*	11.70	12.40	13.55	14.65
Zanesville,O. A10	....	11.70†	12.40	13.55	14.65

	Stator
Vandergrift,Pa. U5	8.10
Mansfield,O. E6	8.10
Warren,O. R2 (Silicon Lowcore)	8.10

SHEETS (22 Ga., coils & cut lengths) Fully Processed (Semiprocessed ½c lower)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa. U5	15.70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	18.10	19.70	20.20	20.70	15.70††
Butler,Pa. A10	....	....	....	19.70	20.20	20.70	....
Vandergrift,Pa. U5	..	17.10	18.10	19.70	20.20	20.70	15.70
Warren,O. R2	....	....	....	....	....	....	15.70‡

*Semiprocessed, †Fully processed only. ‡Coils, annealed; semiprocessed ½c lower. ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	8.00
Aliquippa,Pa. J5	8.00
Alton,Ill. L1	8.20
Atlanta A1	8.00
Bartonville,Ill. K4	8.10
Buffalo W12	8.00
Chicago W13	8.00
Cleveland A7, C20	8.00
Crawfordsville,Ind. M8	8.10
Donora,Pa. A7	8.00
Duluth A7	8.00
Fairfield,Ala. T2	8.00
Fostoria,O.(24) S1	8.10
Houston S5	8.25
Jacksonville,Fla. M8	8.35
Johnstown,Pa. B2	8.00
Joliet,Ill. A7	8.00
KansasCity,Mo. S5	8.25
Kokomo,Ind. C16	8.10
LosAngeles B3	8.95
Minnequa,Colo. C10	8.25
Monessen,Pa. P7, P16	8.00
Palmer,Mass. W12	8.30
Pittsburg,Calif. C11	8.95
Portsmouth,O. P12	8.00
Rankin,Pa. A7	8.00
S.Chicago,Ill. R2	8.00
S.SanFrancisco C10	8.95
SparrowsPoint,Md. B2	8.10
Sterling,Ill.(1) N15	8.00
Sterling,Ill. N15	8.10
Struthers,O. Y1	8.00
Waukegan,Ill. A7	8.00
Worcester,Mass. A7	8.30

WIRE, Cold Heading Carbon

Elyria,O. W8	8.00

Wire, Gal'd., for ACSR

Bartonville,Ill. K4	12.65
Buffalo W12	13.40
Cleveland A7	12.65
Donora,Pa. A7	12.65
Duluth A7	12.65
Johnstown,Pa. B2	13.40
KansasCity,Mo. U3	12.90
Minnequa,Colo. C10	12.775
Monessen,Pa. P7, P16	12.65
Muncie,Ind. I-7	13.60
NewHaven,Conn. A7	12.95
Palmer,Mass. W12	13.70
Pittsburg,Calif. C11	13.45
Portsmouth,O. P12	12.65
Roebling,N.J. R5	12.95
SparrowsPt.,Md. B2	13.50
Struthers,O. Y1	13.40
Trenton,N.J. A7	12.95
Waukegan,Ill. A7	12.65
Worcester,Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Buffalo W12	9.75
Cleveland A7	9.75
Donorra,Pa. A7	9.75
Duluth A7	9.75
Johnstown,Pa. B2	9.75
KansasCity Mo. S5, U3	10.00
LosAngeles B3	10.70
Minnequa,Colo. C10	9.95
Monessen,Pa. P7, P16	9.75
NewHaven,Conn. A7	10.05
Palmer,Mass. W12	10.05
Pittsburg,Calif. C11	10.70
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
S.Chicago,Ill. R2	9.75
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	9.85
Struthers,O. Y1	9.75
Trenton N. J. A7	10.05
Waukegan,Ill. A7	9.75
Worcester,Mass. A7	10.05

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Bartonville,Ill. K4	9.85
Buffalo W12	9.75
Cleveland A7	9.75
Donora,Pa. A7	9.75
Duluth A7	9.75
Fostoria,O. S1	9.80
Johnstown,Pa. B2	9.75
KansasCity,Mo. S5, U3	10.00
LosAngeles B3	10.70
Milbury,Mass.(12) N6	10.05
Minnequa Colo. C10	9.95
Monessen,Pa. P7, P16	9.75
Muncie,Ind. I-7	9.95
Palmer,Mass. W12	10.05
Pittsburg,Calif. C11	10.70
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
S.Chicago,Ill. R2	9.75
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	9.85
Struthers,O. Y1	9.75
Trenton,N.J. A7	10.05
Waukegan Ill. A7	9.75
Wor'ster,Mass.A7,J4,T6	10.05

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	16.50
Bartonville,Ill. K4	16.40
Chicago W13	16.30
Cleveland A7	16.30
Crawfordsville,Ind. M8	16.40
Fostoria,O. S1	16.30
Houston S5	16.55
Jacksonville,Fla. M8	16.65
Johnstown,Pa. B2	16.30
KansasCity,Mo. S5	16.55
Kokomo,Ind. C16	16.30
Minnequa Colo. C16	16.55
Monessen,Pa. P16	16.30
Muncie,Ind. I-7	16.50
Palmer,Mass. W12	16.60
S.SanFrancisco C10	17.15
Waukegan,Ill. A7	16.30
Worcester,Mass. A7, J6	16.60

WIRE, Tire Bead

Bartonville,Ill. K4	17.15
Monessen,Pa. P16	17.15
Roebling,N.J. R5	17.65

ROPE WIRE	(A)
Bartonville,Ill. K4	13.45
Buffalo W12	13.45
Fostoria,O. S1	13.45
KansasCity Mo. U3	13.70
Johnstown,Pa. B2	13.45
Monessen,Pa. P7	13.45
Muncie,Ind. I-7	13.65
Palmer,Mass. W12	13.75
Portsmouth,O. P12	13.45
Roebling,N.J. R5	13.75
St.Louis L8	13.45
SparrowsPt.,Md. B2	13.55
Struthers,O. Y1	13.45
Worcester,Mass. J4	13.75

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

BARS, Reinforcing, Billet (To Fabricators)

AlabamaCity,Ala. R2 ..5.675
Atlanta A11 .....5.675
Birmingham C15 ....5.675
Buffalo R2 .....5.675
Cleveland R2 .....5.675
Ecorse,Mich. G5 .....5.675
Emeryville,Calif. J7 ...6.425
Fairfield,Ala. T2 .....5.675
Fairless Pa. U5 .....5.825
Fontana,Calif. K1 ....6.375
Ft.Worth,Tex(4)(26)T4 5.925
Gary,Ind. U5 .....5.675
Houston S5 .....5.925
Ind.Harbor,Ind. I-2,Y1 5.675
Johnstown,Pa. B2 ....5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo. S5 .....5.925
Kokomo,Ind. C16 ....5.775
Lackawanna,N.Y. B2..5.675
LosAngeles B3 .....6.375
Madison,Ill. L1 .....5.875
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 .....6.375
Pittsburg,Calif. C11 ..6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 ....6.425
SandSprings,Okla. S5 ..5.925
Seattle A24, B3, N14 .6.425
S.Chicago,Ill. R2, W14 .5.675
S.Duquesne,Pa. U5 ....5.675
S.SanFrancisco B3 ....6.425
SparrowsPoint,Md. B2..5.675
Sterling,Ill.(1) N15 ..5.675
Sterling Ill. N15 .....5.775
Struthers,O. Y1 .....5.675
Tonawanda,N.Y. B12 ..6.10
Torrance,Calif. C11 ...6.375
Youngstown R2, U5 ..5.675

BARS, Reinforcing, Billet (Fabricated: To Consumers)

Baltimore B2 .....7.42
Boston B2, U8 .....8.15
Chicago U8 .....7.41
Cleveland U8 .....7.39
Houston S5 .....7.60
Johnstown,Pa. B2 .....7.33
KansasCity,Mo. S5 ....7.60
Lackawanna,N.Y. B2 ..7.35
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.80
Philadelphia U8 .....7.63
Pittsburgh J5, U8 .....7.35
SandSprings,Okla. S5 ..7.60
Seattle A24, B3, N14 ..7.95
SparrowsPt.,Md. B2 ...7.33
St.Paul U8 .....8.17
Williamsport,Pa. S19 ...7.25

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.90
Economy,Pa.(D.R.)B14 18.55
Economy(Staybolt)B14 19.00
McK.Rks.(S.R.) L5 ..14.50
McK.Rks.(D.R.) L5 ...19.80
McK.Rks.(Staybolt)L5. 20.95

BARS, Rail Steel

ChicagoHts.(3) C2, I-2..5.575
ChicagoHts.(4)(44) I-2.5.675
ChicagoHts.(4) C2 ....5.675
Franklin,Pa. (3) F5 ...5.575
Franklin,Pa.(4) F5 ...5.675
JerseyShore,Pa.(3) J8 ..5.55
Marion,O.(3) P11 ....5.575
Tonawanda(3) B12 ...5.575
Tonawanda(4) B12 ....6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

AlabamaCity,Ala. R2 ..5.10
Allenport,Pa. P7 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky.(8) A10 ...5.10
Cleveland J5, R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit(8) M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Fairless,Pa. U5 .....5.15
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Geneva Utah C11 .....5.20
GraniteCity,Ill.(8) G4 ..5.20
Ind.Harbor,Ind. I-2, Y1.5.10
Irvin,Pa. U5 .....5.10
Lackawanna,N.Y. B2 ..5.10
Mansfield,O. E6 .....5.10
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Niles,O. M21, S3 .....5.10
Pittsburg,Calif. C11 ...5.80
Pittsburgh J5 .....5.10
Portsmouth O. P12 ....5.10
Riverdale,Ill. A1 .....5.10
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14 ..5.10
SparrowsPoint,Md. B2 ..5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5, Y1 ....5.10

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21, S3 .....6.275

SHEETS, H.R., Alloy

Gary Ind. U5 .....8.40
Ind.Harbor,Ind. Y1 ....8.40
Irvin,Pa. U5 .....8.40
Munhall,Pa. U5 .....8.40
Newport,Ky. A2 .....8.40
Youngstown U5, Y1 ....8.40

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....7.525
Ashland,Ky. A10 .....7.525
Cleveland J5, R2 .....7.525
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.525
Fairless Pa. U5 .....7.575
Farrell,Pa. S3 .....7.525
Fontana,Calif. K1 .....8.25
Gary,Ind. U5 .....7.525
Ind.Harbor,Ind. I-2, Y1 7.525
Irvin,Pa. U5 .....7.525
Lackawanna(35) B2 ...7.525
Munhall,Pa. U5 .....7.525
Niles,O. S3 .....7.525
Pittsburgh J5 .....7.525
S.Chicago,Ill. U5, W14.7.525
Sharon,Pa. S3 .....7.525
SparrowsPoint(36) B2..7.525
Warren,O. R2 .....7.525
Weirton W.Va. W6 ....7.525
Youngstown U5, Y1 ....7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ...5.35
Cleveland R2 .....5.875
Warren,O. R2 .....5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....7.05
Middletown,O. A10 ....6.775
Warren,O. R2 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 .6.275
Aliquippa,Pa. J5 ....6.275
Allenport,Pa. P7 .....6.275
Cleveland J5, R2 .....6.275
Conshohocken,Pa. A3 ..6.325
Detroit M1 .....6.275
Ecorse,Mich. G5 .....6.275
Fairfield,Ala. T2 .....6.275
Fairless Pa. U5 .....6.325
Follansbee,W.Va. F4 ..6.275
Fontana,Calif. K1 .....7.40
Gary,Ind. U5 .....6.275
GraniteCity,Ill. G4 ....6.375
Ind.Harbor,Ind. I-2, Y1 6.275
Irvin,Pa. U5 .....6.275
Lackawanna,N.Y. B2 .6.275
Mansfield,O. E6 .....6.275
Middletown,O. A10 ....6.275
Newport,Ky. A2 .....6.275
Pittsburg,Calif. C11 ...7.225
Pittsburgh J5 .....6.275
Portsmouth O. P12 ....6.275
SparrowsPoint,Md. B2 .6.275
Steubenville,O. W10 ..6.275
Warren,O. R2 .....6.275
Weirton,W.Va. W6 ....6.275
Yorkville,O. W10 .....6.275
Youngstown Y1 .....6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....9.275
Cleveland J5, R2 .....9.275
Ecorse,Mich. G5 .....9.275
Fairless,Pa. U5 .....9.325
Fontana,Calif. K1 ....10.40
Gary,Ind. U5 .....9.275
Ind.Harbor,Ind. I-2, Y1 9.275
Lackawanna(37) B2 ..9.275
Pittsburgh J5 .....9.275
SparrowsPoint(38) B2..9.275
Warren,O. R2 .....9.275
Weirton,W.Va. W6 ....9.275
Youngstown Y1 .....9.275

SHEETS, Culvert

	Cu Steel	Cu Fe
Ala.City,Ala. R2	7.225	....
Ashland,Ky. A10	7.225	7.475
Canton,O. R2	7.225	7.75
Fairfield,Ala. T2	7.225	7.475
Gary,Ind. U5	7.225	7.475
GraniteCity,Ill.G4	7.325	....
Ind.Harbor I-2	7.225	7.475
Irvin,Pa. U5	7.225	7.475
Kokomo,Ind. C16	7.325	....
MartinsFry. W10	7.225	7.475
Pitts.Calif. C11	7.975	....
Pittsburgh J5	7.225	....
SparrowsPt. B2	7.225	....

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ....7.475

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2.6.875‡
Ashland,Ky. A10 ....6.875‡
Canton,O. R2 .....6.875‡
Dover,O. E6 .....6.875†
Fairfield,Ala. T2 ....6.875†
Gary,Ind. U5 .....6.875†
GraniteCity,Ill. G4 ...6.975*
Ind.Harbor,Ind. I-2 ..6.875†
Irvin,Pa. U5 .....6.875†
Kokomo,Ind. C16 ....6.975‡
MartinsFerry,O. W10..6.875*
Middletown,O. A10 ..6.875†
Pittsburg,Calif. C11 ..7.625*
Pittsburgh J5 .....6.875†
SparrowsPt.,Md. B2..6.875†
Warren,O. R2 .....6.875†
Weirton,W.Va. W6 ...6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....10.125
Pittsburgh J5 .....10.125
SparrowsPt.(39) B2 ..10.025

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.275
Irvin,Pa. U5 .....7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....7.125
Middletown,O. A10 ....7.125

SHEETS, Electrogalvanized

Cleveland(28) R2 .....7.65
Niles,O.(28) R2 .....7.65
Weirton,W.Va. W6 ....7.50
Youngstown J5 .....7.50

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 9.525
Butler,Pa. A10 (type 2) 9.625

SHEETS, Enameling Iron

Ashland Ky. A10 .....6.775
Cleveland R2 .....6.775
Fairfield,Ala. T2 .....6.775
Gary,Ind. U5 .....6.775
Ind.Harbor,Ind. I-2, Y1 6.775
Irvin,Pa. U5 .....6.775
Middletown,O. A10 ....6.775
Niles,O. M21, S3 .....6.775
Youngstown Y1 .....6.775

BLUED STOCK, 29 Gage

Dover,O. E6 .....8.70
Follansbee,W.Va. F4 ...8.70
Ind.Harbor,Ind. I-2 ....8.70
Mansfield,O. E6 .....8.70
Warren O. R2 .....8.70
Yorkville,O. W10 .....8.70

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.225
Gary,Ind. U5 .....7.225
Mansfield,O. E6 .....7.225
Middletown,O. A10 ....7.225
Niles,O. M21, S3 .....7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.625

Key to Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A24 Alaska Steel Mills Inc.

B1 Babcock & Wilcox
B2 Bethlehem Steel Co.
B3 Bethlehem Steel Co., Pacific Coast Div.
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel ofN.Eng.

D2 Detroit Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&FuelAssoc.
E2 Eastern Stainless Steel
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Specality Wire Co. Inc.
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N20 Neville Ferro Alloy Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copprweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless & Strip Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.
S43 Seymour Mfg. Co.
S44 Screw & Bolt Corp. of America

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.
U11 Union Carbide Metals Co.
U13 Union Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Steel Div., Associated Spring Corp.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	5.10
Allenport,Pa. P7	5.10
Alton,Ill. L1	5.30
Ashland,Ky.(8) A10	5.10
Atlanta A11	5.10
Bessemer,Ala. T2	5.10
Birmingham C15	5.10
Buffalo(27) R2	5.10
Conshohocken,Pa. A3	5.15
Detroit M1	5.10
Ecorse,Mich. G5	5.10
Fairfield,Ala. T2	5.10
Farrell,Pa. S3	5.10
Fontana,Calif. K1	5.825
Gary,Ind. U5	5.10
Ind.Harbor,Ind. I-2, Y1	5.10
Johnstown,Pa.(25) B2	5.10
Lackaw'na,N.Y.(25) B2	5.10
LosAngeles(25) B3	5.85
LosAngeles C1	8.60
Minnequa,Colo. C10	6.20
Riverdale,Ill. A1	5.10
SanFrancisco S7	6.60
Seattle(25) B3	6.10
Seattle N14	6.60
Sharon,Pa. S3	5.10
S.Chicago,Ill. W14	5.10
S.SanFrancisco(25) B3	5.85
SparrowsPoint,Md. B2	5.10
Torrance,Calif. C11	5.85
Warren,O. R2	5.10
Weirton,W.Va. W6	5.10
Youngstown U5	5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	8.40
Farrell,Pa. S3	8.40
Gary,Ind. U5	8.40
Houston S5	8.65
Ind.Harbor,Ind. Y1	8.40
KansasCity,Mo. S5	8.65
LosAngeles B3	9.60
Lowellville,O. S3	8.40
Newport,Ky. A2	8.40
Sharon,Pa. A2, S3	8.40
S.Chicago,Ill. W14	8.40
Youngstown U5, Y1	8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky. A10	7.575
Bessemer,Ala. T2	7.575
Conshohocken,Pa. A3	7.575
Ecorse,Mich. G5	7.575
Fairfield,Ala. T2	7.575
Farrell,Pa. S3	7.575
Gary,Ind. U5	7.575
Ind.Harbor,Ind. I-2, Y1	7.575
Lackawanna,N.Y. B2	7.575
LosAngeles(25) B3	8.325
Seattle(25) B3	8.575
Sharon,Pa. S3	7.575
S.Chicago,Ill. W14	7.575
S.SanFrancisco(25) B3	8.325
SparrowsPoint,Md. B2	7.575
Warren,O. R2	7.575
Weirton,W.Va. W6	7.575
Youngstown U5, Y1	7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	5.35
Warren,O. R2	5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	7.425
Baltimore T6	7.425
Boston T6	7.975
Buffalo S40	7.425
Cleveland A7, J5	7.425
Dearborn,Mich. S3	7.425
Detroit D2, M1, P20	7.425
Dover,O. G6	7.425
Evanston,Ill. M22	7.525
Farrell,Pa. S3	7.425
Follansbee,W.Va. W10	7.425
Fontana,Calif. K1	9.20
FranklinPark,Ill. T6	7.525
Ind.Harbor,Ind. Y1	7.425
Indianapolis S41	7.575
LosAngeles C1, S41	9.30
McKeesport,Pa. E10	7.525
NewBedford,Mass. R10	7.875
NewBritain,Conn. S15	7.875
NewCastle,Pa. B4, E5	7.425
NewHaven,Conn. D2	7.875
NewKensington,Pa. A6	7.425
Pawtucket,R.I. R3	7.975
Pawtucket,R.I. N8	7.975
Philadelphia P24	7.875
Pittsburgh J5	7.425
Riverdale,Ill. A1	7.525
Rome,N.Y.(32) R6	7.425
Sharon,Pa. S3	7.425
Trenton,N.J.(31) R5	8.875
Wallingford,Conn. W2	7.875
Warren,O. R2, T5	7.425
Worcester,Mass. A7	7.975

STRIP, Cold-Rolled Alloy

Boston T6	15.90
Carnegie,Pa. S18	15.55
Cleveland A7	15.55
Dover,O. G6	15.55
Farrell,Pa. S3	15.56
FranklinPark,Ill. T6	15.55
Harrison N.J. S18	15.55
Indianapolis S41	15.70
LosAngeles S41	17.75
Lowellville,O. S3	15.55
Pawtucket,R.I. N8	15.90
Riverdale,Ill. A1	15.55
Sharon,Pa. S3	15.55
Worcester,Mass. A7	15.85
Youngstown S41	15.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.80
Dearborn,Mich. S3	10.80
Dover,O. G6	10.80
Farrell,Pa. S3	10.80
Ind.Harbor,Ind. Y1	10.80
Sharon,Pa. S3	10.80
Warren,O. R2	10.80

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	....	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. S3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Farrell,Pa. S3	8.95	10.40	12.60	15.60	18.55
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis S41	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles S41	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	9.85	10.40	12.60	15.60	....
NewYork W3	....	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	....	10.70	12.90	15.90	18.85
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	18.85	22.95	27.80
Buffalo W12	18.85	....	....
Fostoria,O. S1	19.05	22.15	....
FranklinPark,Ill. T6	19.20	23.30	28.15
Harrison,N.J. C18	18.85	22.95	27.80
NewYork W3	18.85	22.95	27.80
Palmer,Mass. W12	18.85	....	....
Trenton,N.J. R5	18.85	22.95	27.80
Worcester,Mass. A7, T6	18.85	22.95	27.80
Youngstown S41	19.20	23.30	28.15

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$9.10	$9.35	$9.75
Fairfield,Ala. T2	9.20	9.45	9.85
Fairless,Pa. U5	9.20	9.45	9.85
Fontana,Calif. K1	9.75	10.00	10.40
Gary,Ind. U5	9.10	9.35	9.75
GraniteCity,Ill. G4	9.20	9.45	9.60
IndianaHarbor,Ind. I-2, Y1	9.10	9.35	9.75
Irvin,Pa. U5	9.10	9.35	9.75
Niles,O. R2	9.10	9.35	9.75
Pittsburg,Calif. C11	9.75	10.00	10.40
SparrowsPoint,Md. B2	9.10	9.35	9.75
Weirton,W.Va. W6	9.10	9.35	9.75
Yorkville,O. W10	9.10	9.35	9.75

ELECTROLYTIC TIN-COATED SHEET Dollars per 100 lb			
Aliquippa,Pa. J5 (21-27 Ga.)	7.90	8.10	....
IndianaHarbor,Ind. Y1 (20-27 Ga.)	7.90	....	....
Niles,O. R2 (20-27 Ga.)	7.90	8.10	8.30

TIN PLATE, Hot Dipped Common Coke	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$10.40	$10.65
Fairfield,Ala. T2	10.50	10.75
Fontana,Calif. K1	11.05	11.30
Gary,Ind. U5	10.40	10.65
Ind.Harb. Y1	10.40	10.65
Irvin,Pa. U5	10.40	10.65
Pitts.,Calif. C11	11.05	11.30
Sp.Pt.,Md. B2	10.40	10.65
Weirton,W.Va. W6	10.40	10.65
Yorkville,O. W10	10.40	10.65

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$8.20
Fairfield,Ala. T2	8.30
Fairless,Pa. U5	8.30
Fontana,Calif. K1	8.85
Gary,Ind. U5	8.20
GraniteCity,Ill. G4	8.30
Ind.Harbor,Ind. I-2, Y1	8.20
Irvin,Pa. U5	8.20
Niles,O. R2	8.20
Pittsburg,Calif. C11	8.85
SparrowsPoint,Md. B2	8.20
Weirton,W.Va. W6	8.20
Yorkville,O. W10	8.20

HOLLOWARE ENAMELING Black Plate (29 Gage)	
Aliquippa,Pa. J5	7.85
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. Y1	7.85
Irvin,Pa. U5	7.85
Yorkville,O. W10	7.85

MANUFACTURING TERNES (Special Coated, Base Box)	
Gary,Ind. U5	$10.05
Irvin,Pa. U5	10.05
Weirton,W.Va. W6	10.80
Youngstown Y1	10.80

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	8.175

STRIP, C.R. Electrogalvanized

Cleveland A7	7.425*
Dover,O. G6	7.425*
Evanston,Ill. M22	7.525*
McKeesport,Pa. E10	7.50*
Riverdale,Ill. A1	7.525*
Warren,O. B9, S3, T5	7.425*
Worcester,Mass. A7	7.975
Youngstown S41, Y1	7.425*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Farrell,Pa. S3	7.50
Sharon,Pa. S3	7.50

TIGHT COOPERAGE HOOP

Atlanta A11	5.65
Farrell,Pa. S3	5.525
Riverdale,Ill. A1	5.675
Sharon,Pa. S3	5.525
Youngstown U5	5.525

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.70	12.40	13.35	14.65
Brackenridge,Pa. A4	....	....	12.40	13.55	14.65
GraniteCity,Ill. G4	9.975*	11.30*	12.00*	13.15*	....
IndianaHarbor,Ind. I-2	9.875*	11.20*	11.90*	13.05*	....
Mansfield,O. E6	9.875*	11.70	12.40	13.55	14.65
Newport,Ky. A2	9.875	11.70*	12.40*	13.55*	14.65*
Niles,O. M21	9.875*	11.70	12.40	13.55	....
Vandergrift,Pa. U5	9.875*	11.70	12.40	13.55	14.65
Warren,O. R2	9.875*	11.70	12.40	13.56	14.65
Zanesville,O. A10	....	11.70†	12.40	13.55	14.65

	Stator
Vandergrift,Pa. U5	8.10
Mansfield,O. E6	8.10
Warren,O. R2 (Silicon Lowcore)	8.10

SHEETS (22 Ga., coils & cut lengths) Fully Processed (Semiprocessed ½c lower)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa. U5	15.70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	18.10	19.70	20.20	20.70	15.70††	
Butler,Pa. A10	....	....	19.70	20.20	20.70	....
Vandergrift,Pa. U5	17.10	18.10	19.70	20.20	20.70	15.70
Warren,O. R2	....	....	....	....	....	15.70‡

*Semiprocessed, †Fully processed only. ‡Coils, annealed; semiprocessed ½c lower. ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	8.00
Aliquippa,Pa. J5	8.00
Alton,Ill. L1	8.20
Atlanta A1	8.00
Bartonville,Ill. K4	8.10
Buffalo W12	8.00
Chicago W13	8.00
Cleveland A7, C20	8.00
Crawfordsville,Ind. M8	8.10
Donora,Pa. A7	8.00
Duluth A7	8.00
Fairfield,Ala. T2	8.00
Fostoria,O.(24) S1	8.10
Houston S5	8.25
Jacksonville,Fla. M8	8.35
Johnstown,Pa. B2	8.00
Joliet,Ill. A7	8.00
KansasCity,Mo. S5	8.25
Kokomo,Ind. C16	8.10
LosAngeles B3	8.95
Minnequa,Colo. C10	8.25
Monessen,Pa. P7, P16	8.00
Palmer,Mass. W12	8.30
Pittsburg,Calif. C11	8.95
Portsmouth,O. P12	8.00
Rankin,Pa. A7	8.00
S.Chicago,Ill. R2	8.00
S.SanFrancisco C10	8.95
SparrowsPoint,Md. B2	8.10
Sterling,Ill.(1) N15	8.00
Sterling,Ill. N15	8.10
Struthers O. Y1	8.00
Waukegan,Ill. A7	8.00
Worcester,Mass. A7	8.30

WIRE, Cold Heading Carbon

Elyria,O. W8	8.00

Wire, Gal'd., for ACSR

Bartonville,Ill. K4	12.65
Buffalo W12	13.40
Cleveland A7	12.65
Donora,Pa. A7	12.65
Duluth A7	12.65
Johnstown,Pa. B2	13.40
KansasCity,Mo. U3	12.90
Minnequa,Colo. C10	12.775
Monessen,Pa. P7, P16	12.65
Muncie,Ind. I-7	13.60
NewHaven,Conn. A7	12.95
Palmer,Mass. W12	13.70
Pittsburg,Calif. C11	13.45
Portsmouth,O. P12	12.65
Roebling,N.J. R5	12.95
SparrowsPt.,Md. B2	13.50
Struthers,O. Y1	13.40
Trenton,N.J. A7	12.95
Waukegan,Ill. A7	12.65
Worcester,Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Buffalo W12	9.75
Cleveland A7	9.75
Donorra,Pa. A7	9.75
Duluth A7	9.75
Johnstown,Pa. B2	9.75
KansasCity Mo. S5, U3	10.00
LosAngeles B3	10.70
Minnequa,Colo. C10	9.95
Monessen,Pa. P7, P16	9.75
NewHaven,Conn. A7	10.05
Palmer,Mass. W12	10.05
Pittsburg,Calif. C11	10.70
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
S.Chicago,Ill. R2	9.75
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	9.85
Struthers,O. Y1	9.75
Trenton,N.J. A7	10.05
Waukegan Ill. A7	9.75
Wor'ster,Mass.A7,J4,T6	10.05

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Bartonville,Ill. K4	9.85
Buffalo W12	9.75
Cleveland A7	9.75
Donora,Pa. A7	9.75
Duluth A7	9.75
Fostoria,O. S1	9.80
Johnstown,Pa. B2	9.75
KansasCity,Mo. S5, U3	10.00
LosAngeles B3	10.70
Milbury,Mass.(12) N6	10.05
Minnequa Colo. C10	9.95
Monessen,Pa. P7, P16	9.75
Muncie,Ind. I-7	9.95
Palmer,Mass. W12	10.05
Pittsburg,Calif. C11	10.70
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
S.Chicago,Ill. R2	9.75
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	9.85
Struthers,O. Y1	9.75
Trenton,N.J. A7	10.05
Waukegan Ill. A7	9.75
Worcester,Mass. A7,J4,T6	10.05

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	16.50
Bartonville,Ill. K4	16.40
Chicago W13	16.30
Cleveland A7	16.30
Crawfordsville,Ind. M8	16.40
Fostoria,O. S1	16.30
Houston S5	16.55
Jacksonville,Fla. M8	16.65
Johnstown,Pa. B2	16.30
KansasCity,Mo. S5	16.55
Kokomo,Ind. C16	16.30
Minnequa Colo. C16	16.55
Monessen,Pa. P16	16.30
Muncie,Ind. I-7	16.50
Palmer,Mass. W12	16.60
S.SanFrancisco C10	17.15
Waukegan Ill. A7	16.30
Worcester,Mass. A7, J6	16.60

WIRE, Tire Bead

Bartonville,Ill. K4	17.15
Monessen,Pa. P16	17.15
Roebling,N.J. R5	17.65

ROPE WIRE (A)

Bartonville,Ill. K4	13.45
Buffalo W12	13.45
Fostoria,O. S1	13.45
KansasCity Mo. U3	13.70
Johnstown,Pa. B2	13.45
Monessen,Pa. P7	13.45
Muncie,Ind. I-7	13.65
Palmer,Mass. W12	13.75
Portsmouth,O. P12	13.45
Roebling,N.J. R5	13.75
St.Louis L8	13.45
SparrowsPt.,Md. B2	13.55
Struthers,O. Y1	13.45
Worcester,Mass. J4	13.75

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

Wire, Cold-Rolled Flat

Anderson,Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	12.35
Chicago W13	12.45
Cleveland A7	12.35
Crawfordsville,Ind. M8	12.35
Dover,O. G6	12.35
Farrell,Pa. S3	12.35
Fostoria,O. S1	12.35
FranklinPark,Ill. T6	12.45
Kokomo,Ind. C16	12.35
Massillon,O. R8	12.35
Milwaukee C23	12.55
Monessen,Pa. P7, P16	12.35
Palmer,Mass. W12	12.65
Pawtucket,R.I. N8	12.65
Philadelphia P24	12.65
Riverdale,Ill. A1	12.45
Rome,N.Y. R6	12.35
Sharon,Pa. S3	12.35
Trenton,N.J. R5	12.65
Warren,O. B9	12.35
Worcester,Mass. A7,T6	12.65

NAILS, Stock

	Col.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. M8	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg, Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	179

(To Wholesalers: per cwt)

Galveston,Tex. D7	$10.30

NAILS, Cut (100 lb keg)

Wheeling,W.Va. W10.	$10.10

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	173
Atlanta A11	177
Bartonville,Ill. K4	175
Crawfordsville,Ind. M8	177
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	180
Jacksonville,Fla. M8	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	173
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	173
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.Iper 97 lb Net Box) Coil No. 3150

AlabamaCity,Ala. R2	$9.24
Atlanta A11	10.36
Bartonville,Ill. K4	9.34
Buffalo W12	10.26
Chicago W13	9.24
Crawfordsville,Ind. M8	9.34
Donora,Pa. A7	9.24
Duluth A7	9.24
Fairfield,Ala. T2	9.24
Houston S5	10.51
Jacksonville,Fla. M8	9.34
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	9.24
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	9.34
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	9.94
S.Chicago, Ill. R2	9.24
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill.(37) N15	9.34

Coil No. 6500 Stand.

AlabamaCity,Ala. R2.	$9.54
Atlanta A11	10.70
Bartonville,Ill. K4	9.64
Buffalo W12	10.60
Chicago W13	9.54
Crawfordsville,Ind. M8	9.64
Donora,Pa. A7	9.54
Duluth A7	9.54
Fairfield,Ala. T2	9.54
Houston S5	10.85
Jacksonville,Fla. M8	9.64
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	9.59
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	9.69
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	10.31
S.Chicago,Ill. R2	9.59
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill.(37) N15	9.69

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$9.59
Atlanta A11	10.75
Bartonville,Ill. K4	9.69
Buffalo W12	10.65
Chicago W13	9.59
Crawfordsville,Ind. M8	9.69
Donora,Pa. A7	9.59
Duluth A7	9.59
Fairfield,Ala. T2	9.59
Houston S5	10.90
Jacksonville,Fla. M8	9.69
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	9.59
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	9.69
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	10.31
S.Chicago,Ill. R2	9.59
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill.(37) N15	9.69

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonsville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill.(7) N15	214

FENCE POSTS

	Col.
Birmingham C15	177
ChicagoHts.,Ill. C2, I-2.	177
Duluth A7	177
Franklin,Pa. F5	177
Johnstown,Pa. B2	177
Marion,O. P11	177
Minnequa,Colo. C10	182
Tonawanda,N.Y. B12	177

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198§
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield, Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. M8	198
Johnstown,Pa. B2	198§
Joliet,Ill A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa ,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213*
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	187**
Aliq'ppa,Pa.9-11½ga.J5	190§
Atlanta A11	192§
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. M8	192
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa ,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192

WIRE (16 gage)

	An'ld Galv.	Stone
Ala.City,Ala.R2	17.85	19.40**
Aliq'ppa,Pa. J5	17.85	19.65
Bartonville K4	17.95	19.80
Cleveland A7	17.85	
Craw'dville B8	17.95	19.80‡‡
Fostoria,O. S1	18.35	19.90†
Houston S5	18.10	19.65**
Jacksonville M8	18.95	19.80‡‡
Johnstown B2	17.85	19.65§
Kan.City,Mo. S5	18.10	
Kokomo C16	17.25	18.80†
Minnequa C10	18.10	19.65**
P'lm'r,Mass.W12	18.15	19.70†
Pitts.,Calif. C11	18.20	19.75†
S.SanFran. C10	18.20	19.75**
St'ling(37) N15	17.95	19.80
SparrowsPt. B2	17.95	19.75§
Waukegan A7	17.85	19.40†
Worcester A7	18.15	

WIRE, Merchant quality (6 to 8 gage)

	An'ld Galv.
Ala.City,Ala. R2	9.00 9.55**
Aliquippa J5	8.65 9.325§
Atlanta(48)A11	9.10 9.775§
Bartonville(48) K4	9.10 9.80
Buffalo W12	9.00 9.55†
Cleveland A7	9.00
Crawfordsville M8	9.10 9.80††
Donora,Pa. A7	9.00 9.55†
Duluth A7	9.00 9.55†
Fairfield T2	9.00 9.55†
Houston(48) S5	9.25 9.80**
Jack'ville,Fla. M8	9.10 9.80‡‡
Johnstown(48) B2	9.00 9.675§
Joliet,Ill. A7	9.00 9.55†
KansCity(48) S5	9.25 9.80**
Kokomo(48) S16	9.10 9.65†
LosAngeles B3	9.95 10.625§
Monessen(48) P7	8.65 9.35§
Palmer,Mass. W12	9.30 9.85†
Pitts.,Calif. C11	9.95 10.50†
Rankin,Pa. A7	9.00 9.55†
S.Chicago R2	9.00 9.55**
S.SanFran. C10	9.95 10.50**
Spar'wsPt.(48)B2	9.10 9.775§
St'ling(37)(48)	N15 9.10 9.80
Struthers,O. Y1	9.00 9.65‡
Worcester,Mass.A7	9.30 9.85†

Based on zinc price of: *13.50. †5c. §10c. ‡Less than 10c. ††10.50c. ‡‡11.00c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill)

BOLTS

Machine Bolts
Full Size Body (cut thread)
½ in. and smaller:

3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0
Longer than 6 in.	37.0
⅝ in., 3 in. & shorter	47.0
3¼ in. thru 6 in.	40.0
Longer than 6 in.	31.0
⅝ in. thru 1 in.:	
6 in. and shorter	37.0
Longer than 6 in.	31.0
1⅛ in. and larger:	
All lengths	31.0

Undersize Body (rolled thread)
½ in. and smaller:

3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0

Carriage Bolts
Full Size Body (cut thread) & Undersize Body (rolled thread)
½ in. and smaller:

6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

Lag, Plow, Tap, Blank, Step, Elevator, Tire, and Fitting Up Bolts
½ in. and smaller:

6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

High Tensile Structural Bolts
(Reg. semifinished hex head bolts, heavy semifinished hex nuts. Bolts — High-carbon steel. heat treated. Spec. (ASTM A-325, in bulk. Full keg quantity)

⅝ in. diam	50.0
¾ in. diam	47.0
⅞ and 1 in. diam	43.0
1⅛ and 1¼ in. diam	34.0

NUTS
(Keg or case quantity and over)

Square Nuts, Reg. & Heavy:

All sizes	56.0

(Full container)

Hex Nuts, Reg. & Heavy
Hot Pressed & Cold Punched:

¾ in. and smaller	62.0
⅞ in. to 1⅛ in., incl.	56.0
1⅛ in. and larger	51.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¾ in. and smaller	62.0
⅞ in. to 1⅛ in. incl.	56.0
1⅛ in. and larger	51.5

Hex Nuts, Finished (Incl. Slotted and Castellated):

⅞ in. and smaller	65.0
1 in. to 1⅛ in., incl.	57.0
1⅛ in. and larger	51.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):

⅝ in. and smaller	62.0
¾ in. to ⅞ in., incl.	56.0
1 in. to 1⅛ in., incl.	57.0
1⅛ in. and larger	51.5

CAP AND SETSCREWS
(Base discounts, packages, per cent off list, f.o.b. mill)
Hex Head Cap Screws, Coarse or Fine Thread, Bright:
6 in. and shorter:

⅝ in. and smaller	35.0
¾, ⅞, and 1 in.	16.0
Longer than 6 in.:	
⅝ in. and smaller	3.0
¾, ⅞, and 1 in.	+11.0

High Carbon, Heat Treated:
6 in. and shorter:

⅝ in. and smaller	20.0
¾, ⅞, and 1 in.	+ 5.0

Longer than 6 in.:

⅝ in. and smaller	+19.0
¾, ⅞, and 1 in.	+39.0

Flat Head Cap Screws:
¾ in. and smaller,
6 in. and shorter + 85.0

Setscrews, Square Head, Cup Point, Coarse Thread:
Through 1 in. diam:
6 in. and shorter + 5.0
Longer than 6 in. +29.0

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.
Structural ½ in., larger 12.85. 7/16 in. and smaller by 6 in. and shorter: 15% off list.

PRESTRESSED STRAND

(High strength, stress relieved; 7 wire uncoated. Net prices per 1000 ft, 40,000 lb and over)

	Standard Diameter, Inches				
	1/4	5/16	3/8	7/16	1/2
Alton,Ill. L1	$28.95	$43.40	$55.40	$73.00	$95.10
Buffalo W12	28.95	43.40	55.40	73.00	95.10
Cleveland A7	28.95	43.40	55.40	73.00	....
KansasCity,Mo. U3	29.85	43.00	55.40	73.00	95.10
Monessen,Pa. P16	32.15	48.20	61.55	81.10	105.65
New Haven,Conn. A7	28.95	43.40	55.40	73.00	95.10
Pittsburg Calif. C11	28.95	43.40	55.40	73 00	95.10
Pueblo,Colo. C10	28.95	43.40	55.40	73.00	95.10
Roebling,N.J. R5	28.95	43.40	55.40	73.00	95.10
SparrowsPoint,Md. B2	28.95	43.40	55.40	73.00	95.10
St.Louis L8	28.95	43.40	55.40	73.00	95.10
Waukegan,Ill. A7	28.95	43.40	55.40	73.00	95.10

RAILWAY MATERIALS

	Standard			Tee Rails
Rails	No. 1	No. 2	All No. 2	60 lb Under
Bessemer,Pa. U5	5.75	5.60	....	6.725
Ensley,Ala. T2	5.75	5.65	....	6.725
Fairfield,Ala. T2	....	....	....	6.725
Gary,Ind. U5	5.75	5.65	....	....
Huntington,W.Va. C15	....	....	....	6.725
Johnstown,Pa. B2	....	....	....	(16)6.725
Lackawanna,N.Y. B2	5.75	5.65	....	6.725
Minnequa,Colo. C10	5.75	5.65	....	7.225
Steelton,Pa. B2	5.75	5.65	....	....
Williamsport,Pa. S19	....	....	....	6.725

TIE PLATES

Fairfield,Ala. T2	6.875
Gary,Ind. U5	6.875
Lackawanna,N.Y. B2	6.875
Minnequa,Colo C10	6.875
Seattle B3	7.025
Steelton,Pa. B2	6.875
Torrance,Calif. C11	6.875

JOINT BARS

Bessemer, Pa. U5	7.25
Fairfield,Ala. T2	7.25
Joliet,Ill. U5	7.25
Lackawanna,N. Y. B2	7.25
Minnequa,Colo. C10	7.25
Steelton,Pa. B2	7.25

AXLES

Ind.Harbor,Ind. S13	9.125
Johnstown,Pa. B2	9.125

TRACK BOLTS, Untreated

Cleveland R2	15.35
KansasCity,Mo. S5	15.35
Lebanon,Pa. B2	15.35
Minnequa,Colo. C10	15.35
Pittsburgh S44	14.75
Seattle B3	15.85

SCREW SPIKES

Lebanon, Pa. B2	15.10

STANDARD TRACK SPIKES

Fairfield,Ala. T2	10.10
Ind.Harbor,Ind. I-2,Y1	10.10
KansasCity,Mo. S5	10.10
Lebanon,Pa. B2	10.10
Minnequa,Colo. C10	10.10
Pittsburgh J5	10.10
Seattle B3	10.60
S.Chicago,Ill. R2	10.10
Struthers,O. Y1	10.10
Youngstown R2	10.10

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1¼ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Deld. in mill zone, 6.295c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.375c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 13 Ga. & lighter; 60" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld in mill zone or within switching limits, 5.635c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.65, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Ambridge, Pa. N2	+12.25	....	+5.75	....	+3.25	....	+1.75	....	+1.75	....	+2	....	0.5	....
Lorain, O. N3	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Youngstown Y1	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

ELECTRICWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown B2	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Alton, Ill. L1	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Benwood, W. Va. W10	1.5	+25	+10.5	+34	+21	+42.5	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Butler, Pa. F6	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Fairless, Pa. N3	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Fontana, Calif. K1	....	....	....	....	....	....	+10.75	+26	+7.75	+22	+4.25	+17.5	+1.75	+16.75
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	1.25	+14	4.25	+10	7.75	+5.5	10.25	+6.25
Lorain, O. N3	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sharon, Pa. S4	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sparrows Pt., Md. B2	2.5	+24	+10.5	+34	+21.5	+43	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Wheatland, Pa. W9	4.5	+22	+8.5	+32	+19.5	+41	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Youngstown R2, Y1	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.72		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Alton, Ill. L1	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Benwood, W. Va. W10	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Etna, Pa. N2	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Fairless, Pa. N3	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+5.5	1.25	+15.5	1.25	+15.5
Fontana, Calif. K1	+1.25	+15.75	+0.75	+15.25	0.75	+15.5	0.75	+15.5	+9.75	+26.5	+9.75	+26.5
Indiana Harbor, Ind. Y1	10.75	+3.75	11.25	+3.25	12.75	+3.5	12.75	+3.5	2.25	+14.5	2.25	+14.5
Lorain, O. N3	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	....	....	....	....
Sharon, Pa. M6	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	....	....	....	....
Sparrows Pt., Md. B2	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Wheatland, Pa. W9	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Youngstown R2, Y1	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5

*Galvanized pipe discounts based on price of zinc at 11.00c, East St. Louis.

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling: Ingot	Rerolling: Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.75	25.00	....	36.00	....	43.50	39.25	48.50	45.00
202	24.75	28.25	37.75	39.00	42.25	44.50	40.00	49.25	49.25
301	24.00	26.00	38.75	37.25	43.50	46.00	41.25	51.25	47.50
302	26.25	29.50	39.50	40.50	44.25	46.75	42.25	52.00	52.00
302B	26.50	30.75	42.25	45.75	46.75	49.00	44.50	57.00	57.00
303	....	33.25	42.50	....	47.25	49.75	45.00	56.75	56.75
304	28.00	31.25	42.00	43.75	47.00	49.50	45.75	55.00	55.00
304L	....	....	49.75	51.50	54.75	57.25	53.50	62.75	62.75
305	29.50	34.75	44.00	47.50	47.00	49.50	46.25	58.75	58.75
308	32.00	36.25	49.00	50.25	54.75	57.75	55.25	63.00	63.00
309	41.25	47.50	60.00	64.50	66.25	69.50	66.00	80.50	80.50
310	51.50	59.50	81.00	84.25	89.75	94.50	87.75	96.75	96.75
314	....	....	80.50	....	89.75	94.50	87.75	....	104.25
316	41.25	47.50	64.50	68.50	71.25	75.75	71.75	80.75	80.75
316L	....	....	72.25	76.25	79.50	83.50	79.50	88.50	88.50
317	49.75	58.00	79.75	88.25	89.50	94.25	88.50	101.00	101.00
321	33.50	38.00	48.75	53.50	54.50	57.50	54.75	65.00	65.50
330	....	....	123.25	....	113.00	143.75	135.00	149.25	149.25
18-8 CbTa	38.50	48.25	57.75	63.50	63.75	67.25	64.75	79.25	79.25
403	....	....	29.25	....	33.25	35.00	30.00	40.25	40.25
405	20.25	26.50	30.75	36.00	34.75	36.50	32.50	46.75	46.75
410	17.50	19.50	29.25	31.00	33.25	35.00	30.00	40.25	40.25
416	....	....	29.75	....	33.75	35.50	31.25	48.25	48.25
420	....	31.50	35.50	41.75	40.75	42.75	40.25	62.00	62.00
430	17.75	19.75	29.75	32.00	33.75	35.50	31.00	40.75	40.75
430F	....	....	30.50	....	34.25	36.00	31.75	51.75	51.75
431	....	29.75	39.25	....	43.50	46.00	41.00	56.00	56.00
446	....	....	40.75	59.00	46.00	48.25	42.75	70.00	70.00

Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; Calstrip Steel Corp.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steel Inc.; Union Steel Corp.; U. S. Steel Corp.; Universal Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel, subsidiary, Allegheny Ludlum Steel Corp.; Washington Steel Corp.; Seymour Mfg. Co.

Clad Steel

	Plates: 5%	Plates: Carbon Base 10%	Plates: Carbon Base 15%	Plates: Carbon Base 20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	26.05	28.80	31.55	34.30	39.75
304L	30.50	33.75	36.95	40.15	....
316	38.20	42.20	46.25	50.25	58.25
316L	42.30	46.75	51.20	55.65	....
316 Cb	49.90	55.15	60.40	65.65	....
321	31.20	34.50	37.75	41.05	47.25
347	36.90	40.80	44.65	48.55	57.00
405	22.25	24.60	26.90	29.25	....
410	20.55	22.70	24.85	27.00	....
430	21.20	23.45	25.65	27.90	....
Inconel	48.90	59.55	70.15	80.55	....
Nickel	41.65	51.95	63.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	$36.10	$43.15

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Reg. Carbon (W-1)	0.330	V-Cr Hot Work (H-13)	0.550
Spec. Carbon (W-1)	0.385	W-Cr Hot Work (H-12)	0.530
Oil Hardening (O-1)	0.505	W Hot Wk. (H-21)	1.425-1.44
V-Cr Hot Work (H-11)	0.505	Hi-Carbon-Cr (D-11)	0.955

Grade by Analysis (%) W	Cr	V	Co	Mo	AISI Designation	$ per lb
18	4	1	....	....	T-1	1.840
18	4	2	....	....	T-2	2.005
13.5	4	3	....	....	T-3	2.105
18.25	4.25	1	4.75	....	T-4	2.545
18	4	2	9	....	T-5	2.915
20.25	4.25	1.6	12.95	....	T-6	4.330
13.75	3.75	2	5	....	T-8	2.485
1.5	4	1	....	8.5	M-1	1.200
6.4	4.5	1.9	....	5	M-2	1.345
6	4	3	....	6	M-3	1.590

Tool steel producers include: A4, A8, B2, B8, C4, C9, C12, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
Birmingham R2	62.00	62.50**	....	....
Birmingham U6	....	62.50**	66.50	....
Woodward, Ala. W15	62.00*	62.50**	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N. Tonawanda, N.Y. T9	....	66.50	67.00	67.50
Tonawanda, N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester, N.Y., deld.	69.02	69.52	70.02	....
Syracuse, N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S. Chicago, Ill. R2	66.00	66.50	66.50	67.00
S. Chicago, Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon, Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron, Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro, Pa. B10	68.00	68.50	69.00	69.50
Chester, Pa. P4	68.00	68.50	69.00	....
Swedeland, Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.50	76.00	....
Newark, N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy, N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland, Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks, Pa., deld.	....	67.60	67.60	68.13
Lawrenceville, Homestead, Wilmerding, Monaca, Pa., deld.	....	68.26	68.26	69.79
Verona, Trafford, Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge, Pa., deld.	68.60	69.10	69.10	69.63
Midland, Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard, Ohio Y1	....	....	66.50	....
Sharpsville, Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	....
Mansfield, Ohio, deld.	71.30	....	71.80	72.30
Duluth I-3	66.00	66.50	66.50	67.00
Erie, Pa. I-3	66.00	66.50	66.50	67.00
Everett, Mass. E1	67.50	68.00	68.50	....
Fontana, Calif. K1	75.00	75.50	....	....
Geneva, Utah C11	66.00	66.50	....	....
GraniteCity, Ill. G4	67.90	68.40	68.90	....
Ironton, Utah C11	66.00	66.50	....	....
Minnequa, Colo. C10	68.00	68.50	69.00	....
Rockwood, Tenn. T3	....	62.50‡	66.50	....
Toledo, Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

*Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.
‡Phos. 0.50% up; Phos. 0.30-0.49%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.01-6.50% silicon; add 75c for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson, Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity, Ky. P15	$99.00
NiagaraFalls, N.Y. P15	99.00
Keokuk, Iowa Open-hearth & Fdry, K2	89.00
Keokuk, Iowa O.H. & Fdry, 12½ lb pigiets, 16% Si, K2	92.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles, Tenn. T3 (Phos. 0.035% max)	$73.00
Rockwood Tenn. T3 (Phos. 0.035% max)	73.00
Troy, N Y R2 (Phos. 0.035% max)	73.00
Philadelphia, deld.	81.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075%)	71.00
Erie, Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland, Pa. P6 (Intermediate) (Phos. 0.036-0.075% max).	71.00

Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Galv. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Atlanta	8.50§	9.86§	10.13	....	8.91	9.39	13.24#	....	9.40	9.29	11.21
Baltimore	9.80[a]	10.00[b]	9.99	....	11.45[c]	10.05[d]	11.80#	16.38	9.55	9.90[e]	10.50
Birmingham	9.43[a]	10.20[b]	....	....	10.91[c]	9.59[d]	13.14#	16.76	9.00	9.79[e]	10.90
Boston	10.07	11.42	11.92	53.50	12.17	10.19	13.30#	15.64	10.64	10.27	11.95
Buffalo	8.40	9.60	10.85	55.98	8.75	9.15	11.45#	15.40	9.25	9.20	10.75
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.25	9.45	10.90	53.00	8.51	8.99	9.15	15.05	9.00	8.89	10.20
Cincinnati	8.43	9.51	10.95	53.42	8.83	9.31	11.58#	15.37	9.56	9.27	10.53
Cleveland	8.54[a]	8.79[b]	10.87	52.33	10.32[c]	8.75[d]	11.25#	15.16	9.39	8.71[e]	10.50[f]
Dallas	8.80	9.30	....	....	8.85	8.80	.. ..	....	8.75	9.15	10.40
Denver	9.40	11.84	12.94	....	9.42	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.51	9.71	11.25	56.50	8.88	9.30	9.51	15.33	9.56	9.26	10.46
Erie, Pa.	8.35	9.45	9.95[10]	....	8.60	9.10	11.25	....	9.35	9.10	10.60
Houston	9.65[a]	9.65[b]	....	52.60	10.85[c]	8.90[d]	13.10#	16.55	8.35	9.65[e]	10.10
Jackson, Miss.	8.52	9.79	....	....	8.84	9.82	10.68	....	9.33	9.22	11.03
Los Angeles	8.70[2]	10.82[2]	12.20	57.60	9.15	9.10[2]	12.95[2]	16.35	9.00[2]	9.10[2]	11.30[2]
Memphis, Tenn.	8.59	9.80	....	....	8.84	9.32	11.25#	....	9.33	9.22	10.86
Milwaukee	8.39	9.59	11.04	....	8.65	9.13	9.39	15.19	9.22	9.03	10.34
Moline, Ill.	8.55	9.80	....	....	8.84	8.95	9.15	....	8.99	8.91	....
New York	9.17	10.49	11.30	53.08	9.64	9.99	13.25#	15.50	9.74	9.77	11.05
Norfolk, Va.	8.65	....	....	....	9.15	9.30	12.75	....	9.65	9.10	10.50
Philadelphia	8.20	9.55	10.61	52.71	9.25	9.40	11.95#	15.48	9.10	9.15	10.40**
Pittsburgh	8.54[a]	8.79[b]	10.76	52.33	10.30[c]	8.64[d]	11.25#	15.05	9.00	8.47[e]	10.26[f]
Richmond, Va.	8.65	....	10.79	....	9.15	9.55	....	....	9.65	9.10	10.60
St. Louis	8.63	9.83	11.28	....	8.89	9.37	9.78	15.43	9.48	9.27	10.58
St. Paul	8.80[a]	9.31[b]	10.47	....	10.32[c]	8.70[d]	11.49#	16.54	9.38	8.60[e]	10.49
San Francisco	9.65	11.10	11.40	55.10	9.75	10.15	13.60	16.25	9.85	10.00	12.35
Seattle	10.30	11.55	12.50	56.52	10.25	10.50	14.70	16.80[2]	10.20	10.10	12.50
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	10.30	11.55	12.50	57.38	10.75	11.00	14.70	16.80	10.20	10.10	13.00
Washington	9.15	....	....	....	9.65	10.05	12.50	....	10.15	9.60	11.10

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed; ‡‡¾ in. to 4 in. wide, inclusive; #net price, 1 in. round C-1018.
[a]10 Ga.; [b]20 Ga.; [c]¼ x 1 in.; [d]¾-2½ in.; [e]¼ x 84 in.; [f]¼ x 36.
Base quantities, 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30,000 lb and over; [2]—30,000 lb; [3]—1000 to 4999 lb; [5]—1000 to 1999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000 pieces*)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchens, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., Canon City, Colo., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $175.

Super-Duty: Ironton, Ohio, Vandalia, Mo. Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $248.

Silica Brick (per 1000 pieces*)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Ft. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., St. Louis, $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill., $168; Canon City, Colo., $173; Lehi, Utah, $183; Los Angeles, $185.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $158; Morrisville, Hays, Latrobe, Pa., $163; E. Chicago, Ind., St. Louis, $168; Canon City, Colo., $183; Curtner, Calif., $185.

Semisilica Brick (per 1000 pieces*)

Woodbridge, N. J., Canon City, Colo., $140; Philadelphia, Clearfield, Pa. $145.

Ladle Brick (per 1000 pieces*)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000 pieces*)

50 *Per Cent.* St Louis, Mexico, Vandalia, Mo., Danville, Ill., $253; Philadelphia, $265; Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 *Per Cent:* St Louis, Mexico, Vandalia, Mo., $310; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $325.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $350; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $365.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $188; Ottawa, Ill., $205.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Nario, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.60.

Magnesite (per net ton)

Domestic, dead-burned, ⅛ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜ in. grains with fines: Baltimore, $73.

*—9 in. x 4½ x 2.50 sts.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade; European, $30-$33, contract; Mexican, all rail, duty paid, $26.50-$27; barge, Brownsville, Tex., $29-$29.50.

Canadian Steel

(Cents per pound, f.o.b. mill, except as otherwise noted)

Billets, Blooms & Slabs:	
Carbon Forging Quality (net ton)	$97.00
Alloy (net ton)	115.00
Wire Rods:	
Carbon, 7/32" to under ¼ in.	5.30
Carbon, ¼ in. to 47/64 in.	5.70
Alloy	6.40
Wire (carload lots)	8.40
Bars & Small Shapes:	
Carbon, merchant quality	5.40
Carbon, special quality	5.85
Alloy	6.40
Bar Mill Bands:	
Carbon	5.40
Alloy	8.05
Structural Size Angles & Zees	5.40
Plates:	
Carbon	5.45
Sheets & Coils, Hot Rolled:	
Carbon Sheets	5.00
Carbon Strip	5.00
Sheets & Coils, Cold Rolled:	
Carbon Sheets	6.35
Carbon Strip (0.080 and lighter)	6.35
Carbon Strip (0.081 and heavier)	6.65
Sheets & Coils, Galvanized:	
Standard Quality	6.70
Culvert Quality	7.00
Sheets, Porcelain Enameling	7.45
Sheets & Coils, Electrical:	
Field Grade	9.00
Armature Grade	9.50
Electrical Grade	10.15
Tin Mill (Per Base Box; **Products** 100 lb basis wt)	
Coke Tin Plate (1.25 lb pot yield)	$10.60
Electrolytic Tin Plate (0.25 lb coating)	9.10
Black Plate	8.30
Nails, c.l. lots, (per keg) **400 keg min.**	$8.15

Metal Powder

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, domestic and foreign, 98% Fe, min. trucklots, freight allowed east of Mississippi River:	
100 mesh, bags	11.50
100 mesh, pails	9.85§
40 mesh, bags	8.10††
Electrolytic Iron,	
Melting stock, 99.87% Fe, irreg. fragments, ⅛ in. x 1.3 in.	28.75
1.3 in.	28.75
(In contract lots of 240 tons price is 22.75c)	
Annealed, 99.5% Fe.	36.75
Unannealed (99+% Fe)	33.25
Unannealed (99+% Fe) (minus 325 mesh)	58.25
Powder Flake (minus 16 plus 100 mesh)	29.25
Carbonyl Iron:	
98.1-98.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	
Aluminum:	
Atomized, 500-lb drum, freight allowed, c.l. 38.50; ton lots 40.50	
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	35.20-51.70†
Bronze, 5000-lb lots	53.00-57.00†
Copper, electrolytic	14.25*
Copper, reduced	14.25*
Lead	7.50*
Manganese, Electrolytic:	
Minus 35 mesh	$1.00
Nickel	$1.15
Nickel-Silver, 5000-lb lots	53.60-57.90†
Phosphor-Copper, 5000-lb lots	65.50
Copper (atomized) 5000-lb lots	46.00-54.50
Solder	7 00*
Silicon	70.00*
Stainless Steel, 304	89.00*
Stainless Steel, 316	$1.07
Tin	14.00*
Zinc, 5000-lb lots	20.20-33.40‡
Tungsten:	Dollars
Carbon reduced, 98.8% min, minus 65 mesh	nom**
Chromium electrolytic 99.8% Cr, min. metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §Cutting and scarfing grade. **Depending on price of ore. ††Welding grade.

Imported Steel

(Base per 100 lb, landed, duty paid; based on current ocean rates with any rise for buyer's acc't. Source of shipment: Western Europe)

	North Atlantic	Great Lakes*	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$6.18	....	$6.13	$6.04	$6.41
Bar Size Angles	6.18	....	6.13	6.04	6.41
Structurals Angles	6.03	....	5.98	5.88	6.28
I-Beams	6.03	....	5.98	5.88	6.28
Channels	6.03	....	5.98	5.88	6.28
Plates (basic bessemer)	5.95	....	5.90	5.80	6.20
Sheets, H.R.	9.00	....	8.95	8.85	9.25
Sheets, Galvanized, 20 Ga., 36 in. x 96 in.	9.90	....	9.85	9.75	10.25
Sheets, Galv. (in coils) 20 Ga., 48 in. wide	10.05	....	10.00	9.90	10.30
Sheets, C.R. (drawing quality)	10.00	....	10.95	10.85	11.25
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.50	....	25.28	24.99	26.68
Barbed Wire (†)	8.00	....	7.95	7.85	8.25
Merchant Bars	6.18	....	6.13	6.04	6.41
Hot-Rolled Bands	8.90	....	8.85	8.75	9.15
Wire Rods, Thomas Commercial No. 5	6.10	....	6.40	6.25	6.60
Wire Rods, O.H.	6.90	....	6.90	6.75	7.10
Bright Common Wire Nails (‡)	8.40	....	8.45	8.35	8.75

*Books closed for 1959-60 shipping season. †Per 82 lb net reel. ‡Per 100-kegs, 20d nails and heavier.

Ores

Lake Superior Iron Ore

(Prices effective at start of the 1959 shipping season, subject to later revision, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 1, 1959, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, concentrates	nom.

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	21.00†
Brazilian iron ore, 68.5%	21.00

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$16.00-$16.50*
Domestic, concentrates f.o.b. milling points	22.00-23.00

*Before duty. †Nominal.

Manganese Ore

Mn 46-48%, Indian 48-90c, nom. per long to unit, c.i.f. U. S. ports, duty for buyer's account.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian	
48% 3:1	$34.00-35.00†
48% no ratio	25.00-26.00†
South African Transvaal	
44% no ratio	18.00†
48% no ratio	24.00-26.00†
Turkish	
48% 3:1	36.00-37.00†
Domestic Rail nearest seller	
18% 3:1	30.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

50-55%	$2.25-2.40
60-65%	2.50-3.10

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

†Nominal.

Metallurgical Coke

Price per net ton

Beehive Ovens	
Connellsville, Pa., furnace	$14.75-15.25
Connellsville, Pa., foundry	18.00-18.50
Oven foundry Coke	
Birmingham, oven	$30.35
Cincinnati, deld.	33.34
Buffalo, ovens	32.00
Detroit, ovens	32.00
Pontiac, Mich., deld.	33.95
Saginaw, Mich., deld.	35.53
Erie, Pa., ovens	32.00
Everett, Mass., ovens:	
New England, deld.	33.55*
Indianapolis, ovens	31.25
Ironton, Ohio, ovens	30.50
Cincinnati, deld.	33.54
Kearny, N. J., ovens	31.25
Milwaukee, ovens	32.00
Neville Island (Pittsburgh), Pa., ovens	30.75
Painesville, Ohio, ovens	32.00
Cleveland, deld.	34.19
Philadelphia, ovens	31.00
St. Louis, ovens	33.00
St. Paul, ovens	31.25
Chicago, deld.	34.68
Swedeland, Pa., ovens	31.00
Terre Haute, Ind., ovens	31.25

*Within $5.15 freight zone from works.

Coal Chemicals

(Representative prices)

Cents per gal f.o.b. tank cars or tank trucks, plant.	
Pure benzene	31.00
Xylene, industrial grade	29.00
Creosote	24.00
Naphthalene, 78 deg	5.00
Toluene one deg (deld. east of Rockies)	25.00
Cents per lb, f.o.b. tank cars or tank trucks, deld.	
Phenol, 90 per cent grade	14.75
Per net ton bulk, f.o.b. cars or trucks, plant	
Ammonium sulfate, regular grade	$32.00

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Neville Island, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx) base price per net ton, $245, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively (Mn 79-81%). Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-95%. Carload, lump, bulk, max 0.07% C 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.5% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn; packed, carload 26.8c, ton lot 28.4c, less ton 29.6c.

Electrolytic Manganese Metal: Min carload, bulk, 33.25c; 2000 lb to min carload 36c; less ton, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi River; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Carload, lump, bulk, 1.50% C grade, 18.5-21% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 16-18.5%, deduct 0.2c from above prices. For 3% grade, Si 12.5-16%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton to 300 lb, $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton to 300 lb $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract min c.l. $250 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis. Spot, $255.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4%). Contract, c.l. $300 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed. Spot, $305.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: C.l. lump, bulk, 28.75c per lb of contained Cr. Delivered.
Charge Chrome 1: Cr 63%, C 6% max, Si 7% max, 22c. **Charge Chrome 2:** Cr. 50-59%, C 8% max, Si 6% max, 23c. Carload, lump, bulk, per lb Cr.

Refined Chrome 1: Cr 50-59%, C 5% max, Si 2% max, 25c. **Refined Chrome 2:** Si 12% max, 24c. Carload, lump, bulk, per lb Cr. **Low-Carbon Ferrochrome:** Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Delivered.

Cr 67-71%, carload, lump, bulk, 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). C.l., 2" x D, bulk 30.8c per lb of contained Cr. Packed, c.l. 32.4c, ton 34.2c, less ton 35.7c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). SM x D, carload, bulk, 20.05c per lb of alloy, carload packed, 21.25c, ton lot 22.50c, less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" x down, 28.25c per lb contained Cr, 14.60c per lb contained Si, 0.75" x down 29.40c per lb contained Cr, 14.60c per lb contained Si.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed, 2" x D plate (about ⅛" thick) $1.15 per lb, ton lot $1.17, less ton lot $1.19. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55% or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Carload, lump, bulk, 14.6c per lb contained Si. Packed, c.l. 17.1c, ton lot 18.55c, less ton 20.20c, f.o.b. Alloy, W.Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Keokuk, Iowa; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Carload, lump, bulk, 15.75c per lb contained silicon. Packed, c.l. 17.75c, ton lot 19.55c, less ton 20.9c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Carload, lump, bulk, 16.9c per lb of contained Si. Packed, c.l. 18.8c, ton lot 20.45c, less ton 21.7c. Delivered. Spot add 0.3c.

90% Ferrosilicon: Carload, lump, bulk, 20c per lb of contained Si. Packed, c.l. 21.65c, ton lot 23.05c, less ton 24.1c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 1.00% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Add 0.5c for 0.50% Fe grade analyzing 98.25% min Si.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.85c per lb of alloy; ton lot, packed, 10.85c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l., lump, bulk, 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Carload, bulk 26.25c per lb of alloy, carload, lump, packed 27.25c, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: 100 lb or more packed (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Carbortam: (B 1 to 2%). Lump, carload $320 per ton, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Carload, lump, bulk 23c per lb of alloy. carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3¾ lb each and containing 2 lb of Cr). Carload, bulk 19.60c per lb of briquet, in bags 20.70c; 5000 lb to c.l pallets 20.80c; 2000 lb to c.l. in bags 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Carload, bulk 14.8c per lb of briquet; c.l., packed, bags 16c; 3000 lb to c.l., pallets 16c; 2000 lb to c.l., bags 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). C.l. bulk 15.1c per lb of briquet; c.l. packed, bags 16.3c; 3000 lb to c.l., pallets 16.3c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si and small sizes, weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 8c per lb of briquet; packed, bags 9.2c; 3000 lb to c.l., pallets 9.6c; 2000 lb to c.l., bags 10.8c; less ton 11.7c. Delivered. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.49 per lb of Mo contained, f.o.b. Langeloth, Pa.

Titanium Briquets: Ti 98.27%, $1 per lb f.o.b. Niagara Falls, N. Y.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.15 per lb (nominal) of contained W. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.1% max). Ton lots 2" x D, $3.45 per lb of contained Cb; less ton lots $3.50 (nominal). Delivered.

Ferrotantalum Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lots 2" x D, $3.05 per lb of contained Cb plus Ta, delivered; less ton lots $3.10.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Carlot bulk 19.25c per lb of alloy, c.l. packed ½ in. x 12 M 20.00c, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 20c per lb of alloy, ton lot 21.15c; less ton lot 22.4c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.45c per lb of alloy; ton lot 19.95c; less ton lot 21.20c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 19.25c. Packed c.l. 20.25c, 2000 lb to c.l. 21.25c; less than 2000 lb 21.75c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $5 for each 1% of P above or below the base). Carload, bulk, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $120 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.76 in all sizes except powdered which is $1.82.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, $1.47, in bags, $1.46, f.o.b. Langeloth and Washington, Pa.

(*Concluded from Page* 118)

Cleveland, Chicago, Los Angeles, Atlanta, and Dallas. Despite the shortage, some builders are still pushing construction jobs at a fast clip, in some cases using substitute materials.

Fabricating plants in the Pacific Northwest report they hold fair order backlogs, but with steel stocks (especially wide flange sections) dwindling, jobs have had to be redesigned to permit use of available steel. Pending contracts in the area include 700 tons for a Tacoma (Wash.) bridge, 400 tons for an apartment house in Tacoma, and an unstated tonnage for a baseball park in that city.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

9125 tons, superstructure, S. Damen Avenue viaduct, Chicago, City of Chicago, to Bethlehem Steel Co., Bethlehem, Pa.

1825 tons, five state highway bridges, Seymour, Conn., to Ingalls Iron Works, Birmingham; Mariani Construction Co. Inc., New Haven, Conn., general contractor.

1410 tons, nine state highway bridges, Newton, Conn., to American Bridge Div., U. S. Steel Corp., Pittsburgh; Arute Bros. Inc., New Britain, Conn., general contractor.

815 tons, three underpasses, Waterford-New London, Conn., to McDermott Steel Specialties Co., New Haven; Onuparik Construction Co. Inc., New London, general contractor.

700 tons, Bomark facilities, Flight B, Langley Field, Virginia, to Globe Iron Construction Co. Inc., Norfolk, Va.; Blount Construction Co., Montgomery, Ala., general contractor.

480 tons, courthouse and federal building, Phoenix, Ariz., to Allison Steel Mfg. Co., Phoenix; Robert E. McKee, El Paso, Tex., general contractor.

260 tons, Public School 272, Brooklyn, N. Y., through Caristo Construction Co., general contractor, to Bethlehem Fabricators, Bethlehem, Pa.

215 tons, I-beams, high tensile, Navy Purchasing Office, Washington, to Bethlehem Steel Co., Bethlehem, Pa.

100 tons, or more, powerplant structures, including intake bulkhead frames and guides, Oahe Reservoir project, Pierre, S. Dak., to O. G. Kelley & Co., Boston.

STRUCTURAL STEEL PENDING

10,000 tons, unit No. 8, Consolidated Edison Co., New York; bids closed.

1953 tons, state bridgework, Nassau County, New York, bids postponed from Oct. 29 to Nov. 19.

700 tons, railroad overcrossing; bids soon to Tacoma, Wash.

400 tons, apartment house addition, Tacoma, Wash.; bids soon.

400 tons, three 6-story apartments, Pocatello, Idaho; bids soon.

110 tons, state bridgework, FARC 59-24, Chautauqua County, New York; opening of bids postponed from Oct. 29 to Nov. 19.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1600 tons, courthouse and federal building, Phoenix, Ariz., to San Jose Steel Co. Inc., Norwalk, Calif.; Robert E. McKee, El Paso, Tex., general contractor.

1500 tons, St. Regis Co. paper mills, Tacoma, Wash., to J. D. English Steel Co., Tacoma; Howard S. Wright Construction Co., Seattle, general contractor.

1470 tons, federal office building, Little Rock, Ark., to Southwest Steel Products Co., Dallas; Robert E. McKee, El Paso, Tex., general contractor.

810 tons, U. S. Engineer, Chicago, to American Industrial Products Co., Cleveland.

665 tons, nine highway bridges and pavement, Newton, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; Arute Bros. Inc., New Britain, Conn., general contractor; 375 tons of mat reinforcement to American Steel & Wire Div., U. S. Steel Corp., Cleveland.

300 tons, Bomarc facilities, Flight B, Langley Field, Virginia, to V. P. Loftis Co., Charlotte, N. C.; Blount Construction Co., Montgomery, Ala., general contractor.

250 tons, office building, Southern New England Telephone Co., New London, Conn., to Capitol Steel Products Corp., New York; Fusco-Amatruda Co., New Haven, Conn., general contractor.

REINFORCING BARS PENDING

100 tons or more, Jackson Road bridge; H. Hagman, Spokane, Wash., low at $51,036 with alternatives to Spokane.

100 tons or more, Kenmore Junior High School, Seattle; general contract to James I. Barnes Construction Co., Seattle, low at $716,460.

Unstated, Oregon State, Benton County overcrossings, 175 ft and 471 ft; bids to Salem, Oreg., Nov. 5.

Unstated, Oregon State, Lane County, McKenzie River overflow bridges, ten structures at five sites; bids to Salem, Oreg., Nov. 5.

Add Plates Placed

280 tons, 2.77 million gallon steel water tank, Alderwood Manor, Wash., to Chicago Bridge & Iron Co., Seattle, at $96,777.

PLATES . . .

PLATES PLACED

305 tons, General Stores Supply Office, Navy, Philadelphia, to C. Itoh & Co. (America) Inc., New York.

PLATES PENDING

100 tons, 200,000 gallon tank, Army Chemical Center, Maryland; bids Nov. 12.

An Important Message For The Man Who Buys

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Scrapmen Await Steel Resumption

Prices marking time at most market centers, pending expected pickup in mill requirements. STEEL's composite holds at $44.33 for third straight week

Scrap Prices, Page 132

• **Chicago**—The delay in getting steel plants back in operation under a Taft-Hartley injunction cooled off the scrap market somewhat, at least to the extent the upward price trend was arrested temporarily. Some steam is still left in the market, but not as much as when the government sought a court injunction and it looked as though reopening of the mills was only the matter of a few days.

A tremendous amount of scrap is stockpiled and available for fast shipment. The mills, though, had good inventories when the strike started and they may proceed cautiously with their buying programs when production gets underway again. Prices are not expected to rise to the same extent they did after the 1956 strike.

• **Philadelphia**—Domestic demand is unchanged, but prices on the railroad specialties are higher on light trading. The market on the major open hearth grades is strong because of foreign demand. On certain items, domestic consumers will have to boost their buying prices at least $3 a ton if they are to compete with the export market, some trade leaders say.

Couplers, springs, and wheels are higher at $50 delivered, and rail crops (2 ft and under) at $66-$68.

• **New York**—Brokers have advanced their buying prices on No. 1 heavy melting steel to $34-$35, on No. 2 heavy melting to $31-$32, and on No. 1 bundles to $33-$34, an increase of $1 in each case. All other grades are unchanged, including cast iron and stainless specialties.

Particular strength in the open hearth grades reflects active foreign demand as well as growing interest among domestic consumers.

• **Pittsburgh**—Shut down for lack of steel, the local plant of General Motors Corp.'s Fisher Body Div. has no factory bundles to sell this month, so it's difficult to gage the market. Cast iron and low phos material remain strong. Indeed, the $54 price tag on punchings and plate scrap suggests that No. 1 heavy melting might be worth $48 or $49 a ton.

• **Cleveland**—Activity in the Valley was confined to bundles, resulting in an advance of $1 a ton on bundles and busheling. Brokers and dealers are marking time pending resumption of active buying by the steel mills. The volume of auto scrap to be offered at the end of the month is uncertain. Lists are fewer, reflecting shutdowns because of the steel shortage. Dealers' yard stocks are heavy, but inventories are largely secondary grades which are hard to move.

• **Detroit**—A flurry of activity in the cast iron grades has moved prices upward on clean auto cast

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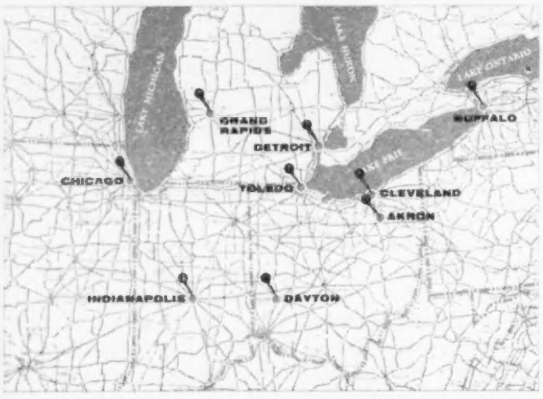

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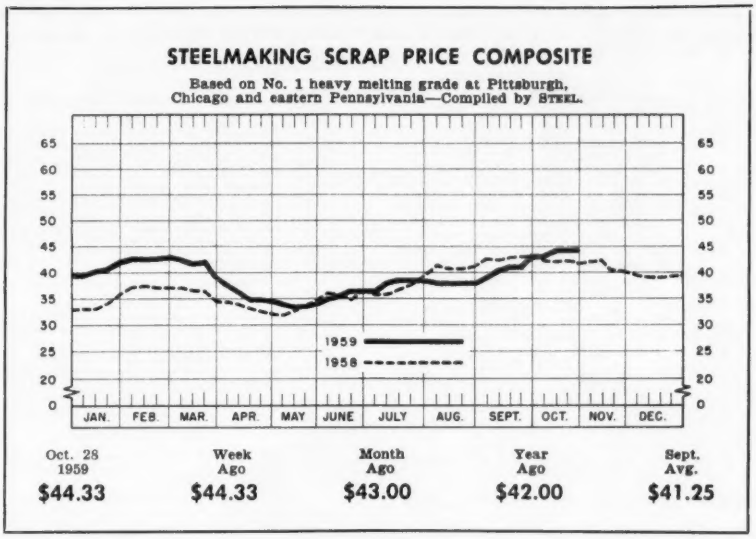


and heavy breakable. Other cast items are up similarly. More changes are expected this week.

Prices on the steel grades are holding as dealers wait to see what happens on monthend auto lists. Chrysler has omitted close to 300 carloads of bundles from its lists. Other items are open for bids, but only on a surplus basis.

Dealers feel the market will move up sharply this week, but brokers point out that yearend inventory and property taxes are coming up, and scrapmen will want to clear out all the scrap they can from yards so they won't have to pay excessive taxes. That could mean a price drop during late November if dealers start to unload surplus stocks.

• **Buffalo**—When local mills start buying scrap again, they may limit shipments to a strict schedule to avoid an initial flood of material. They have a large volume of "boat" scrap ready to move down the lakes as soon as the strike is settled, and a large volume of automotive plant scrap awaits removal to the steel mills.

• **Cincinnati**—The market is strong and prices are firm at the levels established a week ago. Brokers think the steel mills will require more scrap because of a possible ore shortage in coming months. There has been no distress selling of scrap. Low phos material is quoted up $1 at $49-50, reflecting foundry activity.

• **Birmingham** — The market is moderately active and showing considerable strength. A number of tonnage transactions above quoted prices is reported, with 2 ft electric furnace steel bringing up to $42 a ton, about $1 more than electric furnace bundles. The export market is strong, with $45 reported paid at some Gulf ports for No. 1 heavy melting steel.

• **St. Louis**—Prices have spurted on the open hearth and cast iron grades. No. 1 bundles and No. 1 busheling are up $3.50 a ton to $46.50. Supplies of both are diminishing rapidly as factories are closing for lack of steel. Prices on the cast grades are up $1 to $2 a ton.

• **Houston**—Prices are unchanged. Buying for export is the chief market activity, but new purchases for November delivery are expected to be made by the Lone Star (Tex.) mill.

The mill at Houston plans no significant buying when operations are resumed. Brokers that owe the mill tonnages on a prestrike order have been told they may substitute turnings for heavy melting.

Buying for Mexico continues difficult for South Texas brokers because of the slow intake of country scrap.

• **San Francisco**—Some steel scrap is being stockpiled here. Stockpiling and export sales are having a sustaining influence on the price structure. But the real "bang" is missing with open hearth furnaces cold because of the strike.

• **Los Angeles**—The market is quiet and prices are steady. No change in quotations is expected until steel plants reopen.

• **Seattle**—Yards are cramped for space because of heavy inventories. Activity in the market is slight pending resumption of steelmaking operations. Prices are unchanged but they are nominal. Little interest is shown in tonnage for export.

Scrap Statistics Changes Urged by Senate Group

CHANGES in statistical practices respecting scrap were suggested by the Senate Select Small Business Committee in an appendix to its recent report on monopoly and technological problems of the scrap industry (STEEL, Oct. 26, p. 253). The committee said deficiencies in the statistics handicap detection and enforcement of antitrust law violations.

It suggested that the Census Bureau:

1. Abandon combining the statistics for all segments of the steel industry in one category, and restore the former practice of presenting the data for the separate elements of that industry. This change would show the contribution of scrap to the total cost of producing steel.

2. The concentration ratio should be given on a geographical basis, by natural market areas, probably by states and metropolitan areas.

3. Sales should be given by company in addition to establishment or yard. Both No. 2 and 3 would show market controls by company on a national, as well as regional basis.

• **Other Action Urged**—The committee also suggested that the Bureau of Mines make efforts to satisfy the following needs:

1. Purchased scrap should be separated into "obsolete" and "prompt industrial" categories, enabling the bureau to assess the reservoir and contribution of obsolete scrap to shortages.

2. There should be enough consumer coverage to publish scrap consumption by grades by classes of consumers, showing shifts in con-

(*Please turn to Page* 138)

Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL, Oct. 28, 1959. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Oct. 28	$44.33
Oct. 21	44.33
Sept. Avg.	41.25
Oct. 1958	42.25
Oct. 1954	32.25

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	44.00-45.00
No. 2 heavy melting	35.00-36.00
No. 1 dealer bundles	45.00-46.00
No. 2 bundles	31.00-32.00
No. 1 bushelling	44.00-45.00
No. 1 factory bundles	*54.00-55.00*
Machine shop turnings	*24.00-25.00*
Mixed borings, turnings	*24.00-25.00*
Short shovel turnings	29.00-30.00
Cast iron borings	29.00-30.00
Cut structurals:	
2 ft and under	51.00-52.00
3 ft and under	50.00-51.00
Heavy turnings	35.00-36.00
Punchings & plate scrap	*53.00-54.00*
Electric furnace bundles	53.00-54.00

Cast Iron Grades

No. 1 cupola	*49.00-50.00*
Stove plate	46.00-47.00
Unstripped motor blocks	34.00-35.00
Clean auto cast	47.00-48.00
Drop broken machinery	53.00-54.00

Railroad Scrap

No. 1 R.R. heavy melt.	49.00-50.00
Rails, 2 ft and under	65.00-66.00
Rails, 18 in. and under	66.00-67.00
Random rails	60.00-61.00
Angles, splice bars	59.00-60.00
Railroad specialties	59.00-60.00
Rails, rerolling	65.00-66.00

Stainless Steel Scrap

18-8 bundles & solids	230.00-235.00
18-8 turnings	115.00-120.00
430 bundles & solids	125.00-130.00
430 turnings	55.00-65.00

CHICAGO

No. 1 hvy melt., indus.	44.00-45.00
No. 1 hvy melt., dealer	42.00-43.00
No. 2 hvy melting	39.00-40.00
No. 1 factory bundles	48.00-49.00
No. 1 dealer bundles	*43.00-44.00*
No. 2 bundles	29.00-30.00
No. 1 busheling, indus.	44.00-45.00
No. 1 busheling, dealer	42.00-43.00
Machine shop turnings	*24.00-25.00*
Mixed borings, turnings	26.00-27.00
Short shovel turnings	26.00-27.00
Cast iron borings	26.00-27.00
Cut structurals, 3 ft	*51.00-52.00*
Punchings & plate scrap	*53.00-54.00*

Cast Iron Grades

No. 1 cupola	57.00-58.00
Stove plate	52.00-53.00
Unstripped motor blocks	48.00-49.00
Clean auto cast	63.00-64.00
Drop broken machinery	63.00-64.00

Railroad Scrap

No. 1 R.R. heavy melt.	48.00-49.00
R.R. malleable	65.00-66.00
Rails, 2 ft and under	63.00-64.00
Rails, 18 in. and under	64.00-65.00
Angles, splice bars	57.00-58.00
Axles	57.00-58.00
Rails, rerolling	64.00-65.00

Stainless Steel Scrap

18-8 bundles, solids	215.00-220.00
18-8 turnings	115.00-120.00
430 bundles & solids	115.00-120.00
430 turnings	55.00-60.00

YOUNGSTOWN

No. 1 heavy melting	44.00-45.00
No. 2 heavy melting	28.00-29.00
No. 1 busheling	*47.00-48.00*
No. 1 bundles	*47.00-48.00*
No. 2 bundles	*29.00-30.00*
Machine shop turnings	18.00-19.00
Short shovel turnings	23.00-24.00
Cast iron borings	23.00-24.00
Low phos.	47.00-48.00
Electric furnace bundles	47.00-48.00

Railroad Scrap

No. 1 R.R. heavy melt.	46.00-47.00

CLEVELAND

No. 1 heavy melting	41.00-42.00
No. 2 heavy melting	28.00-29.00
No. 1 factory bundles	46.00-47.00
No. 1 bundles	42.00-43.00
No. 2 bundles	26.00-27.00
No. 1 busheling	42.00-43.00
Machine shop turnings	15.00-16.00
Short shovel turnings	21.00-22.00
Mixed borings, turnings	21.00-22.00
Cast iron borings	21.00-22.00
Cut foundry steel	41.00-42.00
Cut structurals, plate 2 ft and under	51.00-52.00
Low phos. punchings & plate	43.00-44.00
Alloy free, short shovel turnings	23.00-24.00
Electric furnace bundles	43.00-44.00

Cast Iron Grades

No. 1 cupola	55.00-56.00
Charging box cast	41.00-42.00
Heavy breakable cast	41.00-42.00
Stove plate	47.00-48.00
Unstripped motor blocks	39.00-40.00
Brake shoes	39.00-40.00
Clean auto cast	58.00-59.00
Burnt cast	40.00-41.00
Drop broken machinery	55.00-56.00

Railroad Scrap

R.R. malleable	66.00-67.00
Rails, 2 ft and under	61.00-62.00
Rails, 18 in. and under	62.00-63.00
Rails, random lengths	55.00-56.00
Cast steel	49.00-50.00
No. 1 railroad cast	58.50-59.50
Railroad specialties	55.00-56.00
Angles, splice bars	55.00-56.00
Rails, rerolling	70.00-71.00

Stainless Steel

(Brokers' buying prices: f.o.b. shipping point)

18-8 bundles, solids	215.00-220.00
18-8 turnings	110.00-115.00
430 clips, bundles, solids	125.00-130.00
430 turnings	45.00-55.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	*37.00-40.00*
No. 2 heavy melting	*35.00-38.00*
No. 1 bundles	*46.50*
No. 2 bundles	26.00
No. 1 busheling	*46.50*
Machine shop turnings	*20.00*
Short shovel turnings	*22.00*

Cast Iron Grades

No. 1 cupola	*55.00*
Charging box cast	*46.00*
Heavy breakable cast	44.00
Unstripped motor blocks	*45.00*
Clean auto cast	56.00
Stove plate	*44.00*

Railroad Scrap

No. 1 R.R heavy melt.	49.00
Rails, 18 in. and under	*56.00*
Rails, random lengths	*51.00*
Rails, rerolling	65.00
Angles, splice bars	50.00

BIRMINGHAM

No. 1 heavy melting	35.00-36.00
No. 2 heavy melting	30.00-31.00
No. 1 bundles	38.00-39.00
No. 2 bundles	24.00-25.00
No. 1 busheling	*41.00-42.00*
Cast iron borings	14.00-15.00
Machine shop turnings	24.00-25.00
Short shovel turnings	27.00-28.00
Bar crops and plate	*46.00-47.00*
Structurals & plates	*45.00-46.00*
Electric furnace bundles	40.00-41.00
Electric furnace:	
3 ft and under	38.00-39.00
2 ft and under	39.00-40.00

Cast Iron Grades

No. 1 cupola	53.00-54.00
Stove plate	53.00-54.00
Charging box cast	29.00-30.00
Unstripped motor blocks	41.00-42.00
No. 1 wheels	43.00-44.00

Railroad Scrap

No. 1 R.R. heavy melt.	39.00-40.00
Rails, 18 in. and under	49.00-50.00
Rails, rerolling	63.00-64.00
Rails, random lengths	54.00-55.00
Tngles, splice bars	*46.00-47.00*

PHILADELPHIA

No. 1 heavy melting	45.00
No. 2 heavy melting	39.00
No. 1 bundles	47.00
No. 2 bundles	29.00
No. 1 busheling	47.00
Electric furnace bundles	48.00
Mixed borings, turnings	21.00-22.00†
Short shovel turnings	27.00
Machine shop turnings	24.00
Heavy turnings	35.00†
Structurals & plates	48.00-50.00
Couplers, springs, wheels	*50.00*
Rail crops, 2 ft & under	*66.00-68.00*

Cast Iron Grades

No. 1 cupola	46.00-47.00
Heavy breakable cast	48.00
Drop broken machinery	54.00
Malleable	68.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*34.00-35.00*
No. 2 heavy melting	*31.00-32.00*
No. 1 bundles	*33.00-34.00*
No. 2 bundles	21.00-22.00
Machine shop turnings	10.00-11.00
Mixed borings, turnings	13.00-14.00
Short shovel turnings	14.00-15.00
Low phos. structurals & plates	36.00-37.00

Cast Iron Grades

No. 1 cupola	38.00-39.00
Unstripped motor blocks	25.00-26.00
Heavy breakable	35.00-36.00

Stainless Steel

18-8 sheets, clips, solids	195.00-200.00
18-8 borings, turnings	85.00-90.00
410 sheets, clips, solids	55.00-60.00
430 sheets, clips, solids	85.00-90.00

BUFFALO

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	28.00-29.00
No. 1 bundles	33.00-34.00
No. 2 bundles	23.00-24.00
No. 1 busheling	33.00-34.00
Short shovel turnings	21.00-22.00
Machine shop turnings	17.00-18.00
Cast iron borings	19.00-20.00
Low phos structurals and plate, 2 ft and under	43.00-44.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	47.00-48.00
No. 1 machinery	51.00-52.00

Railroad Scrap

Rails, random lengths	45.00-46.00
Rails, 3 ft and under	51.00-52.00
Railroad specialties	43.00-44.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	37.50-38.50
No. 2 heavy melting	32.50-33.50
No. 1 bundles	37.50-38.50
No. 2 bundles	27.00-28.00
No. 1 busheling	37.50-38.50
Machine shop turning	19.00-20.00
Mixed borings, turnings	19.00-20.00
Short shovel turnings	21.00-22.00
Cast iron borings	20.00-21.00
Low phos., 18 in.	*49.00-50.00*

Cast Iron Grades

No. 1 cupola	48.00-49.00
Heavy breakable cast	43.00-44.00
Charging box cast	43.00-44.00
Drop broken machinery	58.00-59.00

Railroad Scrap

No. 1 R.R. heavy melt.	42.00-43.00
Rails, 18 in. and under	58.00-59.00
Rails, random lengths	50.00-51.00

HOUSTON

(Exporters' buying prices; f.a.s.)

No. 1 heavy melting	39.00
No. 2 heavy melting	35.00-36.00
No. 2 bundles	25.00-26.00

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	34.00†
No. 2 heavy melting	31.00†
No. 1 bundles	34.00
No. 2 bundles	20.00†
Machine shop turnings	17.00
Short shovel turnings	20.00
Low phos. plates & structurals	46.00-47.00

Cast Iron Grades

No. 1 cupola	47.00-48.00
Heavy breakable	35.00
Foundry malleable	43.00-44.00
Unstripped motor blocks	38.50-39.50

Railroad Scrap

No. 1 R.R. heavy melt.	38.00-39.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	25.50-26.50
No. 1 bundles	35.00-36.00
No. 1 busheling	35.00-36.00
Machine shop turnings	*12.00-13.00*
Short shovel turnings	*15.00-16.00*
No 1 cast	37.00-38.00
Mixed cupola cast	36.00-37.00
No. 1 machinery cast	38.00-38.50

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	36.50-37.50
No. 2 heavy melting	25.00-26.00
No. 1 bundles	39.50-40.50
No. 2 bundles	23.00-24.00
No. 1 busheling	35.50-36.50
Machine shop turnings	16.00-17.00
Mixed borings, turnings	17.00-18.00
Short shovel turnings	18.00-19.00

Cast Iron Grades

No. 1 cupola	46.00-47.00
Stove plate	*40.00-41.00*
Heavy breakable	*40.00-41.00*
Unstripped motor blocks	*32.00-33.00*
Charging box cast	*40.00-41.00*
Clean auto cast	*52.00-53.00*

SEATTLE

No. 1 heavy melting	35.00†
No. 2 heavy melting	32.00-33.00
No. 1 bundles	25.00
No. 2 bundles	22.00†
Machine shop turnings	17.00†
Mixed borings, turnings	17.00†
Electric furnace No. 1.	38.00†

Cast Iron Grades

No. 1 cupola	34.00†
Heavy breakable cast	28.00†
Unstripped motor blocks	26.00†
Stove plate (f.o.b. plant)	21.00†

LOS ANGELES

No. 1 heavy melting	*38.00*
No. 2 heavy melting	38.00
No. 1 bundles	35.00
No. 2 bundles	22.00
Machine shop turnings	18.00
Shovel turnings	20.00
Cast iron borings	18.00
Cut structurals and plate 1 ft and under	48.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	47.00

Railroad Scrap

No. 1 R.R. heavy melt.	39.00

SAN FRANCISCO

No. 1 heavy melting	36.00
No. 2 heavy melting	33.00
No. 1 bundles	33.00
No. 2 bundles	22.00
Machine shop turnings	16.00
Mixed borings, turnings	16.00
Cast iron borings	16.00
Heavy turnings	16.00
Short shovel turnings	16.00
Cut structurals, 3 ft	42.00

Cast Iron Grades

No. 1 cupola	47.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT

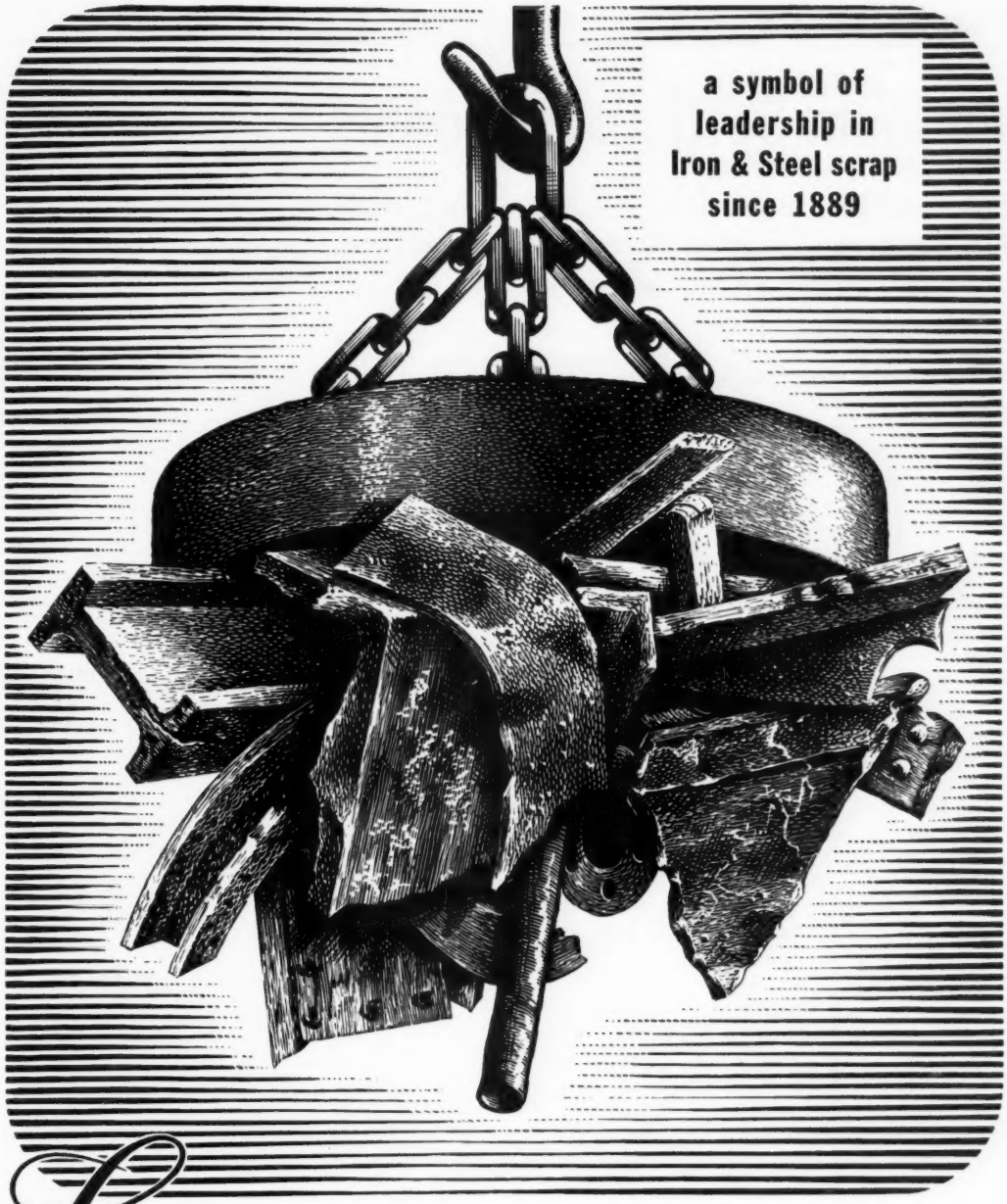
(Brokers' buying prices)

No. 1 heavy melting	32.25
No. 2 heavy melting	28.25
No. 1 bundles	32.25
No. 2 bundles	22.75
Mixed steel scrap	24.25
Mixed borings, turnings	13.00
Busheling, new factory: Prepared	32.25
Unprepared	26.25
Short steel turnings	17.00

Cast Iron Grades‡

No. 1 machinery cast	46.50-48.00

•Delivered to docks.
†Nominal.
‡F.o.b. Hamilton, Ont.



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Aluminum Settlement Looms

If Kaiser's steel pact is offered to aluminum workers, a new contract may be signed shortly. Betting is that copper, lead, zinc talks will continue. Market is in turmoil

Nonferrous Metal Prices, Page 136

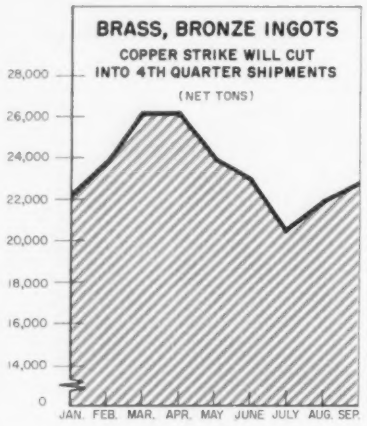
FROM New York's plush Downtown Athletic Club to the oak paneled offices of San Francisco mining interests, nonferrous men were pondering one question last week: What influence will the Kaiser settlement in steel have on nonferrous labor negotiations?

• **Lots of Speculation** — As STEEL went to press late last week, rumor was heavy that Kaiser would offer a similar package to its aluminum workers. It would mean a package settlement in the neighborhood of 19.5 to 22.5 cents an hour over a two year period, probably broken down like this: First year, 10 cents in SUB, pensions, and insurance. Second year, 9 cents in wages, ½ cent in insurance, a maximum of 3 cents in cost of living.

If Kaiser offers such a contract, the other producers will have to match it. The question is whether they would follow immediately or wait until Big Steel settles. Producers signed a pact with the USW and other aluminum unions in August that extended their contracts until Nov. 1. But a clause added: The extension will continue until it is terminated by either side on ten days' written notice.

If Kaiser breaks the ice, it would appear that other producers have little to gain by waiting. Under terms of the extension agreement, all gains under a new contract are retroactive to Aug. 1. The provision has caused much concern to aluminum financial men because they've been operating under "unknown costs" since then.

• **Copper**—Effects of the steel settlement and a new contract in aluminum on the copper industry are problematical. Some observers think the union will try to squeeze a settlement out of Kennecott first, not only because it is the largest producer, but because they feel that Kennecott would offer the biggest package. Certainly, Kennecott's offer of several weeks ago to the USW of 17.9 cents an hour is not too far out of line with the Kaiser settlement. But there's one big difference: Kaiser didn't insist on a change in the language surrounding "work practices." Indications are Kennecott is still determined to get some change in that area.



Source: Council of the Ingot & Bronze Industry.

Other copper producers say they positively won't go as high as the Kaiser offer, even if Kennecott signs a similar agreement. Lead and zinc people are thinking in terms of only about half the amount in the Kaiser package. You could see a settlement by part of the industry, continued deadlocks for the rest.

• **Hitch** — One factor that has slowed negotiations in copper: Competition for membership between the USW and Mine-Mill union. The USW has been reluctant to bargain seriously until it saw what steel would offer. The Mine-Mill hasn't wanted to bargain until it saw how the USW made out.

Market Hectic

Strike pressures have taken their toll on the blood pressures of nonferrous marketing men and the stability of the market. Take zinc, for example: On Oct. 21 one producer raised the price 1 cent a pound to 13 cents. After most of the industry had followed, another company announced it was going up only 0.5 cent. Some of those that had gone up to 13 then came down to 12.5, others didn't. So you now have a split price in the market of 12.5 to 13 cents a pound. Metalmen look for the price to go up 0.5 cent after a steel settlement.

• **Copper Short**—The copper market is hectic and becoming more so. Primary producers don't have a single pound of metal to sell. The only operating custom smelter is no longer quoting a price. Supply of wire bars is short and the lack of metal is becoming critical at wire mills. Some metal is still available from dealers but they're asking close to 40 cents a pound.

NONFERROUS PRICE RECORD

	Oct. 28 Price	Last Change	Previous Price	Sept. Avg	Aug. Avg	Oct., 1958 Avg
Aluminum	24.70	Aug. 1, 1958	24.00	24.700	24.700	24.700
Copper	30.00-31.50	Oct. 26, 1959	30.00-33.00	31.500	30.010	25.058
Lead	12.80	Aug. 24, 1959	11.80	12.800	12.069	12.437
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	101.625	Oct. 27, 1959	101.75	102.440	102.333	96.500
Zinc	12.50-13.00	Oct. 23, 1959	12.00-13.00	11.360	11.000	10.865

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. customer custody; MAGNESIUM, pig 99.8%, Velasco, Tex.

Last year, traffic accidents killed 37,000, injured 1,400,000

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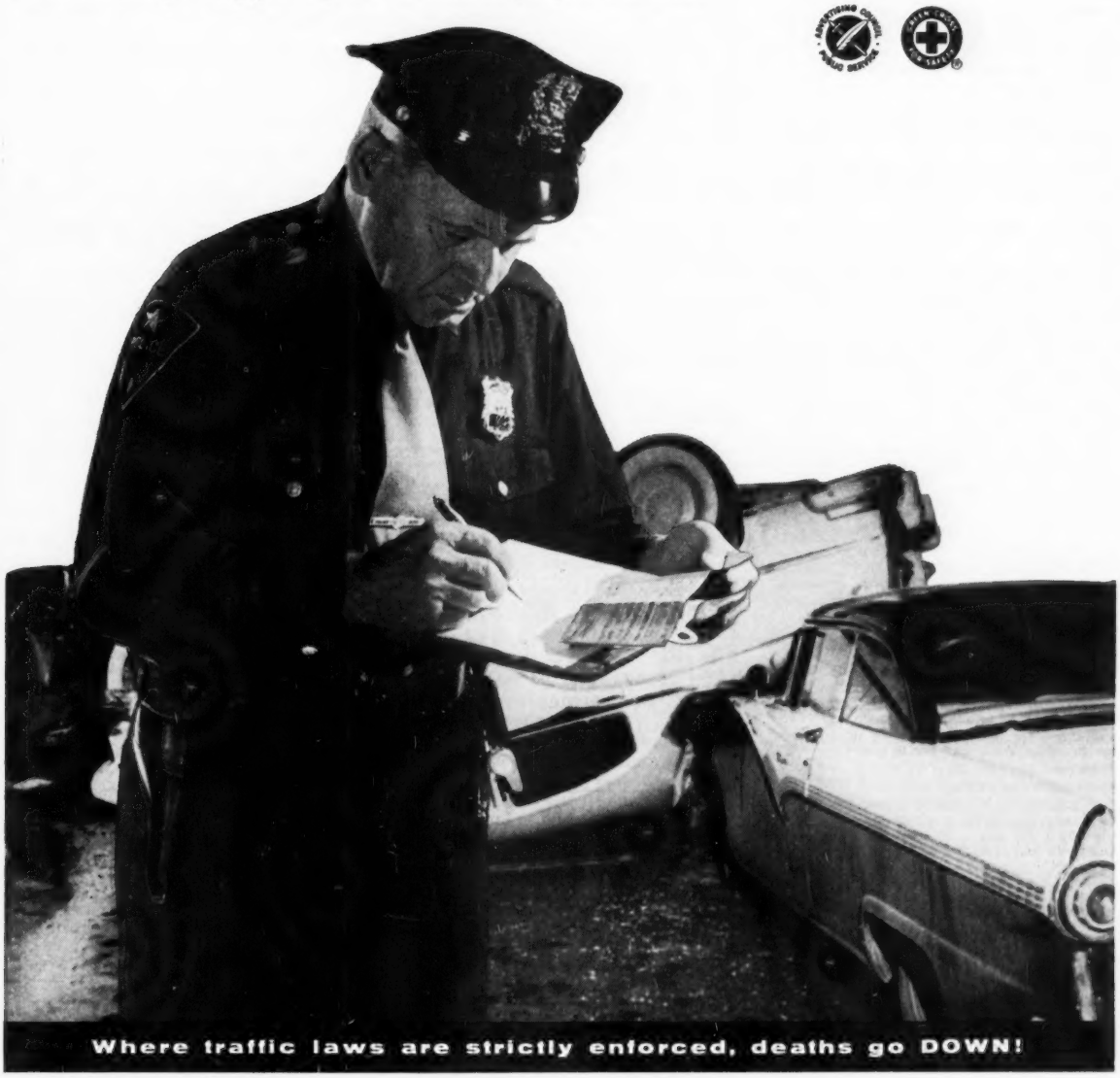
Traffic accidents' human toll is so tragic we sometimes overlook their staggering economic waste. Five Billion Dollars in lost wages, medical expenses, insurance costs and property damage! Your business—every business—shares in this loss. So you have a double interest in helping reduce traffic accidents. And you *can* help! Drive safely and obey the law yourself . . . certainly. But go further. Use your influence to promote safe driving and urge strict law enforcement. To make your efforts more effective, join with others working actively to reduce traffic hazards in your community. *Support your local Safety Council!*



Published in an effort to save lives, in cooperation with the National Safety Council and The Advertising Council.

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 24.70; ingots, 26.80, 30,000 lb or more, f.o.b. customer custody.

Aluminum Alloy: No. 13, 28.60; No. 43, 28.40; No. 195, 29.40; No. 214, 30.20; No. 356, 28.60; 30 or 40 lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 24.50-25.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.75% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.40 per lb deld.

Cobalt: 99+%, $1.75 per lb for 500-lb keg, $1.77 per lb for 100 lb case; $1.82 per lb under 100 lb.

Columbium: Powder, $55-85 per lb nom.

Copper: Electrolytic, 30.00-31.50 deld.; custom smelters, nom.; lake, 31.50 deld.; fire refined, 29.75-31.25 deld.

Germanium: First reduction, less than 1 kg, 38.30 per gram; 1-10 kg, 33.30 per gram; 10 kg or more, 31.30 per gram; intrinsic grade, 33.30-35.30 per gram.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $75-80 per troy oz nom.

Lead: Common, 12.80; chemical, 12.90; corroding, 12.90, St. Louis, New York basis, add 0.20.

Lithium: 1 lb or 2 lb ingots, less than 50 lb, $11 per lb, f.o.b. Minneapolis; 50-99 lb, $10; 100-499 lb, $9.50; 500 lb or more, $9 per lb, delivered.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $224-226 per 75 lb flask.

Molybdenum: Unalloyed forging billets, 4.125-7.0 in. diam., 50-4999 lb, $8.15-11.50 per lb, depending on quantity; 5000 lb or more, $8 per lb, f.o.b. Coldwater, Mich.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. ports of entry, contained nickel, 69.60.

Osmium: $70-100 per troy oz nom.

Palladium: $20-22 per troy oz.

Platinum: $77-80 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $122-125 per troy oz.

Ruthenium: $55-60 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market, 91.375 per troy oz.

Sodium: Solid pack, c.l., 19.50; l.c.l., 20.00; brick, c.l., 21.00; l.c.l., 21.50; tank car, 17.00.

Tantalum: Melting stock, $35 per lb; rod, $60 per lb nom.; sheet, $55 per lb nom.

Tellurium: $2.50 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot and prompt, 101.625.

Titanium: Sponge, 99.3 + % grade A-1, ductile (0.3% Fe max.), $1.60 per lb; grade A-2 (0.5% Fe max.), $1.50 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $2.75-2.90 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99+% hydrogen reduced, $3.00-3.80.

Zinc: Prime western, 12.50-13.00; brass special, 12.75-13.25; intermediate, 13.00-13.50, East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 13.75-14.25; special high grade, 14.00-14.50 deld. Diecasting alloy ingot No. 3, 15.75-16.25; No. 2, 16.25-16.75; No. 5, 16.00-16.50 deld.

Zirconium: Reactor grade sponge, 100 lb or less, $8 per lb; 100-500 lb, $7.00 per lb; over 500 lb, $6.50 per lb.
(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 26.00-27.75; No. 12 foundry alloy (No. 2 grade), 23.75-24.00; 5% silicon alloy, 0.60 Cu max., 25.50; 13 alloy, 0.60 Cu max., 25.00; 195 alloy, 26.75-27.00; 108 alloy, 24.25-24.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 24.50; grade 2, 23.25; grade 3, 22.25; grade 4, 21.50.

Brass Ingot: Red brass, No. 115, 29.25; tin bronze, No. 225, 39.75; No. 245, 33.50; high-leaded tin bronze, No. 305, 33.50; No. 1 yellow, No. 405, 23.75; manganese bronze, No. 421, 26.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.91, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.89, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 20,000-lb lots, 36.85; l.c.l., 37.48. Weatherproof, 20,000-lb lots, 37.42; l.c.l., 38.17.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $18.50 per cwt; pipe, full coils, $18.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheet and strip, $7.25-17.00; sheared mill plate, $5.25-10.00; wire, $5.75-10.00; forging billets, $3.55-5.75; hot-rolled and forged bars, $4.25-7.50.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 26.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	138	120	138
Strip, C.R.	124	108	138
Plate, H.R.	130	110	126
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003, and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.250-0.136	42.80-47.30	.....
0.136-0.096	43.20-48.30	.....
0.126-0.103	.....	39.20-39.80
0.096-0.077	43.80-50.00	39.30-40.00
0.077-0.068	44.30-52.20	.....
0.077-0.061	.....	39.50-40.70
0.068-0.061	44.30-52.20	.....
0.061-0.048	44.90-54.40	40.10-41.80
0.048-0.038	45.40-57.10	40.60-43.20
0.038-0.030	45.70-62.00	41.00-45.70
0.030-0.024	46.20-53.70	41.30-45.70
0.024-0.019	46.90-56.80	42.40-44.10
0.019-0.017	47.70-54.10	43.00-44.70
0.017-0.015	48.60-55.00	43.80-45.50
0.015-0.014	46.60	44.80-46.50
0.014-0.012	50.80	45.50
0.012-0.011	51.00	46.70
0.011-0.0095	53.50	48.10
0.0095-0.0085	54.60	49.60
0.0085-0.0075	56.20	50.85
0.0075-0.007	57.70	52.30
0.007-0.006	59.30	53.70

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grades, .032 in., 171.30; .081 in., 108.80; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.10; .25-.75 in., 70.60-71.60. Tooling plate, 0.25-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	65.30-67.60	84.60-87.40
12-14	65.30-67.60	85.70-88.00
24-26	66.10-75.30	90.60-91.30
36-38	66.10-75.30	104.20-105.30

NONFERROUS SCRAP

DEALERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 26.00-26.50; No. 2 heavy copper and wire, 24.00-24.50; light copper, 22.00-22.50; No. 1 composition red brass, 19.00-19.50; No. 1 composition turnings, 17.50-18.00; new brass clippings, 15.25-15.75; light brass, 12.00-12.25; heavy yellow brass, 13.25-13.75; new brass rod ends, 13.00-13.50; auto radiators, unsweated, 14.50-15.00; cocks and faucets, 14.75-15.25; brass pipe, 14.75-15.25.

Lead: Soft scrap lead, 8.50-9.00; battery plates, 4.25-4.50; linotype and stereotype, 10.00-10.50; electrotype, 8.25-8.75; mixed babbitt, 9.25-9.75.

Monel: Clippings, 30.00-32.00; old sheets 26.00-28.00; turnings, 20.00-22.00; rods, 30.00-32.00.

Nickel: Sheets and clips, 52.00-54.00; rolled anodes, 52.00-54.00; turnings, 39.00-40.00; rod ends, 52.00-54.00.

Zinc: Old zinc, 4.00-4.50; new diecast scrap, 3.75-4.00; old diecast scrap, 2.25-2.50.

Aluminum: Old castings and sheets, 11.00-11.50; clean borings and turnings, 7.00-7.50; segregated low copper clips, 15.00-15.50; segregated high copper clips, 14.00-14.50; mixed low copper clips, 14.50-15.00; mixed high copper clips, 12.50-13.00.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 12.25-12.75; clean borings and turnings, 10.00-10.50; segregated low copper clips, 16.75-17.25; segregated high copper clips, 16.00-16.50; mixed low copper clips, 16.00-16.50; mixed high copper clips, 15.75-16.25.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 11.50-11.75; clean borings and turnings, 10.50-11.00; segregated low copper clips, 15.75-16.25; segregated high copper clips, 14.75-15.25; mixed low copper clips, 15.25-15.75; mixed high copper clips, 14.25-14.75.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 57.50; light scrap, 52.50; turnings and borings, 37.50.

Copper and Brass: No. 1 heavy copper and wire, nom.; No. 2 heavy copper and wire, nom.; light copper 24.00; refinery brass (60% copper) dry copper content, 26.00.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, nom.; No. 2 heavy copper and wire, nom.; light copper, 24.00; No. 1 composition borings, 22.50; No. 1 composition solids, 23.00; heavy yellow brass solids, 16.50; yellow brass turnings, 15.50; radiators, 18.00.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES e (Based on copper at 31.50c)		
	Sheets, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	54.63b	52.86c	....	55.82	27.500	27.500	26.750
Yellow Brass	48.65	34.21d	49.19	52.06	21.000	20.125	19.125
Low Brass, 80%	51.48	51.42	52.02	54.79	23.500	23.250	22.750
Red Brass, 85%	52.48	52.42	53.02	55.79	24.375	24.125	23.625
Com. Bronze, 90%	54.02	53.96	54.56	57.08	25.250	25.000	24.500
Manganese Bronze	57.00	50.68	61.12	....	19.750	19.500	18.875
Muntz Metal	51.35	46.66	....	....	19.875	19.625	19.125
Naval Brass	53.29	47.10	59.85	56.70	19.625	19.375	18.875
Silicon Bronze	60.67	59.86	60.21	78.35	27.000	26.750	26.000
Nickel Silver, 10%	64.13	66.46	66.46	....	25.875	25.625	12.812
Phos. Bronze	75.34	75.84	77.02	78.625	28.625	28.375	27.375

a. Cents per lb, f.o.b. mill; freight allowed on 50 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

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1 Mill Type Bldg. 382'0 x 67'0 with 15 Ton Crane, 65'0 cc of Rails, Lift 47'0.

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The position requires the daily supervision of the rolling and finishing areas. The rolling area consists of multi-purpose rolling facilities, unique in design, and capable of very diversified operations. Both hot and cold rolling of sheet, bars and coils of refractory metals will be involved. Experience in finishing, heat-treating and inspection is essential.

Production Supervisor—Melting

The position requires previous experience in consumable electrode-cold mold-arc melting operations. In addition, thorough knowledge of electrode preparation and the behavior of refractory metals on melting and solidification is required.

Trained personnel in physical and mechanical metallurgy or those with equivalent experience are needed for these supervisory openings. Please forward resume, including details of education, experience and salary expected to **Mr. A. F. Hartford**, Employee Relations Department, **E. I. du Pont de Nemours & Company, Wilmington, Delaware.** Replies held confidential.

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He must be able to handle men—

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22 ga., 24 ga. and 26 ga. New, unstained. Up to 80 tons. All or part. Give sizes, quantities, price and location. Can also use 4″, 5″, 6″, 8″ and 10″ structural steel channels; 7″, 8″, 10″, 14″ I-beams.

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2 Used Cranes—15 ton capacity hoist—30 ft. lift—38′7″ span—wheels to run on 35 lb. rail—3/60/220—AC current. Maximum wheel load 25,000 lbs. 125 ft. minimum trolley speed. 250-300 ft. min. bridge speed—magnetic controls. 25-30 ft. min. hoist speed. Mail complete description and offer to J. A. Graham, The Dayton Steel Foundry Company, P. O. Box 1022, Dayton 1, Ohio.

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PLANT SUPERINTENDENT, STRUCTURAL STEEL FABRICATOR, 10 to 15 years' supervisory experience—familiar with riveted and welded bridge construction—heavy mill building, etc. Salary open. Send resume to Box 801, STEEL, Penton Bldg., Cleveland 13, Ohio, or call Pittsburgh, Pa., Poplar 1-5277.

Positions Wanted

GENERAL MANAGER: Twenty-five years experience; administration of production, purchasing, accounting, sales. Steel, high temperature alloys, reactive metals. Forging bar mill and sheet mill background. Reply Box 797, STEEL, Penton Bldg., Cleveland 13, Ohio.

(*Concluded from Page* 131)

sumption and enabling the bureau to assess their significance.

3. By improving the sample items, the bureau should be able to test the significance of geographical consumption by grades and the geography of dealers' receipts and shipments, thus providing a check on the reason for, and locations of, shortages.

4. The bureau should undertake research into the capacity to handle and process scrap by grades, furthering emergency planning to assess the scrap industry's ability to expand when necessary.

5. Data should be collected on the costs of collection and operations, so that shortages might be better understood.

6. Information should be collected periodically by industry classification on the sources of "obsolete" and "prompt industrial" scrap by grade, to better understand the flow from all sources.

Aluminum Pipe Utilized In Gas Gathering System

Aluminum Co. of America has completed installation of a 4500 ft, 8 in., aluminum pipeline, part of a gas gathering system at its Point Comfort, Tex., site of operations. Unistrength pipe and a high speed, automatic, pipe welding machine were used for the first time.

Unistrength pipe is seamless. At Point Comfort, 8 in. pipe of 6063-T6 alloy was used. Nominal wall thickness at pipe ends is 0.322 in., while along the length it is 0.204 in.

Shipments of Barrels, Pails, Drums Drop in August

Shipments of steel shipping barrels and drums in August totaled 2,481,909 units, off 13 per cent from July shipments, and 6 per cent from deliveries in August, 1958. Shipments in the first eight months of the year were 23,782,497 units vs. 20,667,265 in the like 1958 period.

August shipments of steel pails were 6,733,545 units vs. 7,294,396 in July, and 6,418,968 in August last year. Deliveries in the first eight months amounted to 56,256,757 units vs. 48,226,217 in the like 1958 period.

ACRO
WELDER MFG. CO.
MILWAUKEE

WELDING ENGINEERS

MACHINERY BUILDERS

ESTABLISHED
1936

RICHLY DIVERSIFIED

CLOSE TO MILLIONS

Mississippi is located in the heart of the new, growing South. Within a 200-mile radius is a multi-billion dollar market . . . yet

MISSISSIPPI

is years away from the frustrating congestion and other complex problems that plague many areas.

For Futher Information Contact
MISSISSIPPI AGRICULTURAL AND INDUSTRIAL BOARD
Jackson, Mississippi

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LET TMI QUALITY HELP

Cut Your Assembly Cost Corners

QUICKLY! SAFELY!

TMI customers are doing it day in and day out in almost every phase of metalworking where small diameter cold drawn tubing plays an important part. With our eagle eye close on every quality control test, on every quality operation, we are delivering tubing that is the "arch enemy of waste" on any assembly line. Quality! Straightness! Smoothness! Accuracy—close as ±.00025" when the designing requires the finest! The result: less machining, faster assembly, faultless performance, and a quality reputation all around. Call, write or wire: we'll do our best to prove there's no substitute for the best in quality . . . no substitute for TMI small diameter stainless steel and special alloy tubing: .050" to 1.250" O.D.

Only the Best Quality Cold Drawn Stainless Steel and Special Alloy Tubing Is Worthy of the Name

TMI!

Serving a selected list of pioneering customers in aviation, nuclear energy, instrumentation and quality manufacturers in the metalworking industry. If your work is classified it stays that way *all ways* at TMI.

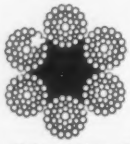
TUBE METHODS INC., Bridgeport, Montgomery County, Pennsylvania. Engineers, Metallurgists and Manufacturers Since 1941.

The Mark of Quality TMI

YOU CAN'T BARGAIN WITH SAFETY

WICKWIRE ROPES FOR INDUSTRIAL USE

6 x 25 Filler Wire, FC



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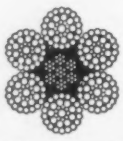

6 x 46 Filler Wire, IWRC

For detailed recommendations, write the nearest CF&I sales office and ask for WR 722.

For safety and performance

. . . *order* CF&I-WICKWIRE

"job-designed" wire ropes

The Image of CF&I—a giant steelman—stands for the rigid quality-controls and testing procedures that are carried out in the production of Wickwire Rope. This Image also reflects CF&I's ability to design a specific product to meet a particular need.

These are the very reasons why CF&I-Wickwire Ropes are both *safe*—as only a *quality* wire rope can be—and *suitable*—because they are available in a *complete range* of wire grades, types, sizes and constructions, designed to meet each industry's requirements.

Avoid the losses—due to injuries and wrecked equipment—that can occur when a "bargain" rope fails. Buy a quality wire rope that's designed for the job it must do—a CF&I-Wickwire Rope.

WICKWIRE ROPE

THE COLORADO FUEL AND IRON CORPORATION

CF&I STEEL

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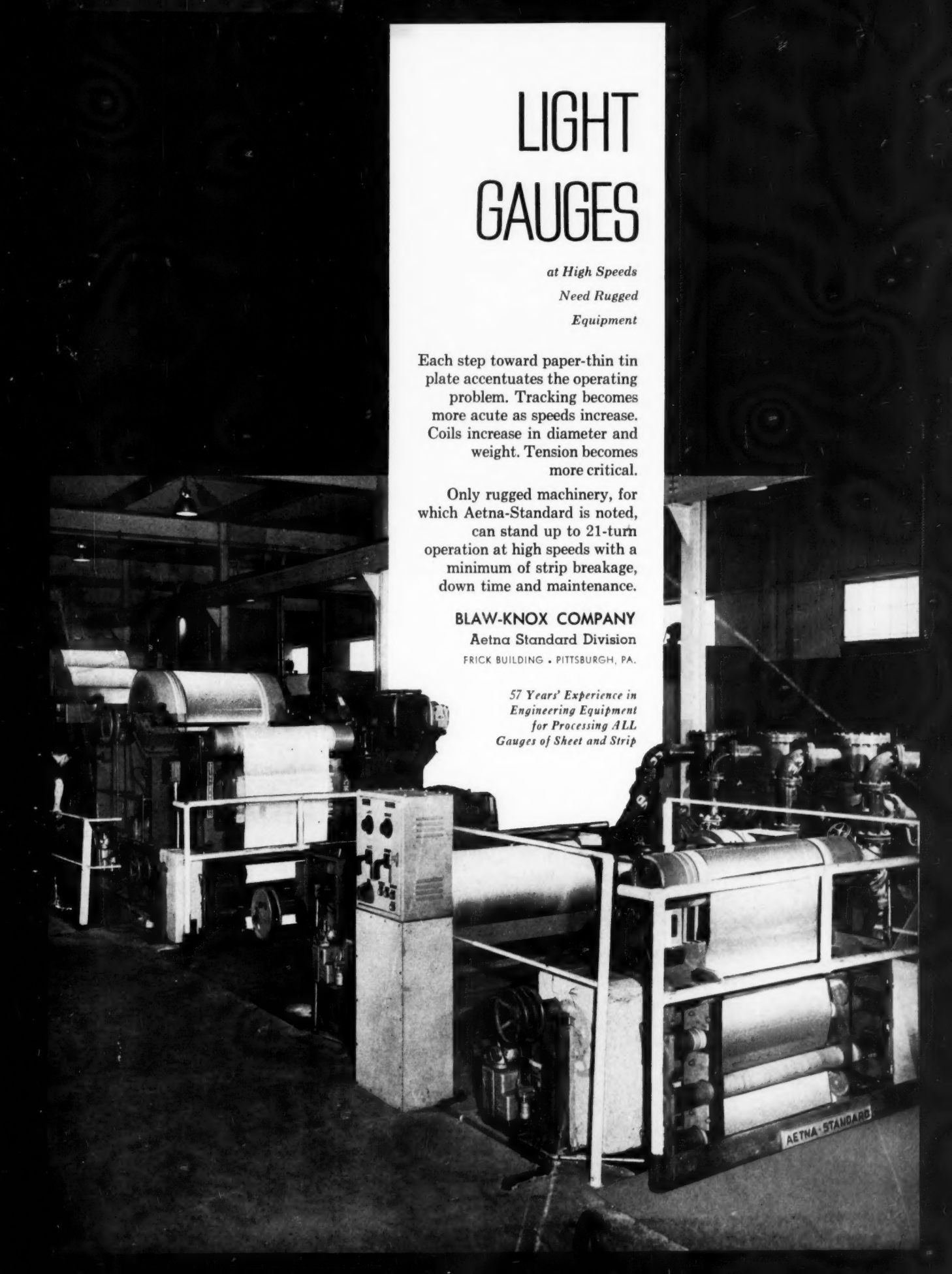


LIGHT GAUGES

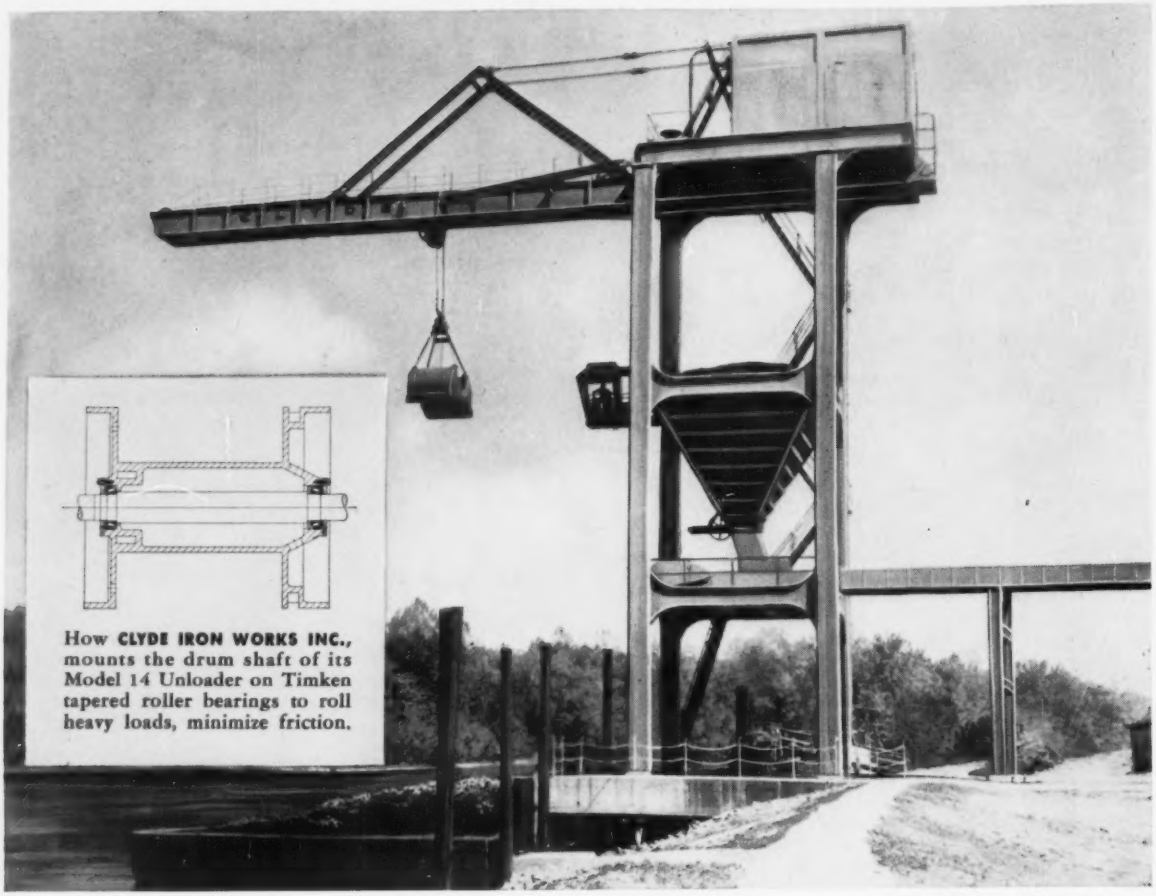
at High Speeds
Need Rugged
Equipment

Each step toward paper-thin tin plate accentuates the operating problem. Tracking becomes more acute as speeds increase. Coils increase in diameter and weight. Tension becomes more critical.

Only rugged machinery, for which Aetna-Standard is noted, can stand up to 21-turn operation at high speeds with a minimum of strip breakage, down time and maintenance.

BLAW-KNOX COMPANY
Aetna Standard Division
FRICK BUILDING • PITTSBURGH, PA.

57 Years' Experience in Engineering Equipment for Processing ALL Gauges of Sheet and Strip



How **CLYDE IRON WORKS INC.,** mounts the drum shaft of its Model 14 Unloader on Timken tapered roller bearings to roll heavy loads, minimize friction.

Clyde Unloader unloads 250 T.P.H. as 22 Timken® bearings roll the loads

UNLOADING coal barges at a 250 ton-per-hour rate puts terrific loads on the hoist drums and sheaves of the Clyde Model 14 Unloader. To roll the heavy loads steadily and smoothly, Clyde engineers mount the three drums and eight sheaves on a total of 22 Timken® tapered roller bearings.

Timken bearings have *extra* load-carrying capacity. That's because of full-line contact between their rollers and races. And the tapered construction of Timken bearings lets them take both radial and thrust loads in any combination. Because they're geometrically designed and precision-manufactured to roll true, Timken bearings practically eliminate friction. They reduce power loss, last longer; keep the drums and sheaves working smoother, steadier, with less maintenance.

To get all these advantages when you buy or build machines, specify Timken tapered roller bearings. Look for the "Timken Bearing Equipped" label. It's your symbol of Better-ness. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ont. Cable address: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.*

First in bearings for 60 years

BETTER-NESS rolls on

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